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A TALK ON LITTLE THINGS.

"It's the little things that count." That's what the man said when the nurse told him of the safe arrival of the fifth pair of twins. And the reason why they count is because they don't stay little. They grow up. Little cents make dollars; little losses make large liabilities; little minutes make hours; little savings make large gains.

To-day is the day of little things. The superficial observer will shake his head skeptically and say that that is not so; it is the day of large things and enterprises. In the ultimate, this is true; but the greatness has been achieved and is now maintained by the gathering together and systematising of the little things.

The man who complains of the dullness of trade and takes a pessimistic view of business in general is the man who, when customers and contracts are scarce, will wander over to the neighbor's store and spend three hours discussing the general damnation of the country at the hands of the trusts.

He could have washed his store-front. He did not. It was a "little thing," too little to be attended to. A possible customer passed that store while he was out. He was only a "little customer." He needed a small repair on a leaky tap. The dirty closet-combination, almost concealed by the equally dirty window-glass, repelled him, prevented him from even thinking of attempting to do business there. He did not hesitate, however, at entering the hardware-store a block further down, on the clean window of which was the sign "Plumbing Repairs Promptly Attended To."

For five years that "little customer" had been saving up enough cash to start building a home of his own. The spring would, if fortune favored, see his goal within reach.

When the spring came and fortune had proved more than kind, did this "little thing" count in determining who should or should not have an opportunity to secure that plumbing and heating contract? **It did.**

No! The hardware-man did not get it. He was asked to bid on it but because he was not well enough equipped to undertake the work, he recom-

mended an up-to-date plumber in another part of the town—a man of good business standing, up-to-date methods, whose commercial ability was equal to that of the hardware man.

Our hard-luck friend spent a few days complaining of the invasion of HIS territory by the other plumber. His territory? What a peculiar idea! The sooner we forget the territory-idea, **that territory-idea,** the greater will be our progress.

Assigning territories as a result of mutual agreement is a different proposition. But because a store is located in a certain neighborhood, and its owner imagines he can draw a territorial circle-line, within which he expects to maintain a monopoly of trade, is only a glaring proof of his narrow-minded egotism. **Sitting down in the center of your camp-lines never won any victories nor held any kingdoms.**

The King of Portugal less than three months ago claimed Portugal for his territory. Accident of birth and location gave him some reason for his claim. He could not pawn his title for a meal-ticket on Broadway now.

While he was claiming power and authority, little men with little thoughts, but live ones, banded together and in a day of climax, a crown was made worth only its price in the melting-pot.

"No time to read trade-journals." Another "little thing." Many men say that. Men often have no time for anything unless it is spelled with three naughts at the end of it.

The men that have no time to read trade-journals are the very ones that write in quickest to find out something which has been covered over and over again in the journals they do not value enough to read or have not energy enough to study.

We are keeping watch year by year on our live subscribers, those who read the paper, contribute to it from time to time voluntarily and without the mere desire for publicity. These are not the men who tell hard-luck stories. They attend to the little things daily in their business. They make money. They are busy men, but they not only find time to read "Domestic Engineering" but also to minister to the needs of their brethren in the trade by contributions to our columns.

The plumber or steam-fitter who aims to succeed in business and to stay "succeeded" must take care of the little things. There is no limit to their range; there is no moment when we can say "It is enough; I know it all."

Would you like a list of these little things? Sure, help yourself. They are all new, devoid of sand-holes, will not warp or check, and are garanteed by the maker.

Courtesy to customer and employee. Honesty in quality of goods furnished and character of workmanship. Cleanliness of shop, person and speech. Study of human nature. Friendliness to competitors. Honesty to the trade and yourself in estimating. Habitual study and thought on sanitary matters even if only for fifteen minutes daily. Cheerfulness in all things. Cultivation of the power to assimilate knowledge, analyze facts and systematize your thinking.

Never should a day pass that one is not able to take stock at its close and say "This I have learned that I knew not before." A man who has not gained some fresh item of knowledge or thought some new thought in twenty-four hours is headed for the ash-barrel. He will find his territory to be of the shape of a long box.

Watch the little things! They grow by nursing. As they grow, you will be able to give them employment in your service. They will prove invaluable servants.

THE PLUMBER AND THE LIGHTING TRADE.

Dark nights are coming early, and the time of the year is here when users of gas and electricity for residential purposes are discarding old shades and fixtures and taking on the new. It is just at this point where the modern plumbing establishment is in a position to make a turn of profit, providing, of course, the up-to-date plumber has a similar line of good things.

There is no reason why the plumber should not do just as good a trade in the fixture and shade lines as the department store. In fact, the opinion prevails that the plumber is in a better position to do a heavier business than any other dealer in his town. Like all business lines, the lighting line has got to be worked, and worked hard and on a system.

One new line of shades has been brought out recently that gives promise of being a good thing for dealers. The line has had many imitations, but the Holophane factory is now making a line for homes which gives promise of having a record sale. Six new shapes for home fixtures are being shown, all of which are in crystal effects.

Strange as it may appear, the shade with beaded fringe is not having the heavy sale this season it possessed last and in previous years. The beaded fringe did not have the staying qualities, and the constant dropping of beads on the floor became a nuisance to the careful housewife.

In place of a shade with this effect a soft decorated shade is coming into prominence. Matt effects are very popular in some sections and in others the iced treatments are having a most remarkable sale. As a matter of fact, these effects are to be had in various shapes, for both the upright and inverted fixtures.

On the shower-light shades there is one eastern manufacturer who is experiencing a wonderful sale on a shade which has a water lily treatment. There are plenty of individual and exclusive styles in this new assortment of shades. The lily proposition is an exceptionally strong one. It is roughed on the inside and the leaf in natural color is followed as an exterior treatment. The effect of these shades, when the light is beneath, is really one of the most attractive to be obtained. Dealers who can see their way clear to add this particular line of shades to their stock would soon make a quick turn-over.

The very latest improvement on incandescent burners

is the split-tube regulator. This is entirely original in its operation, in that it regulates from the outside, leaving a solid stream of gas, instead of obstructing the center by a needle point. This new burner is made by an eastern manufacturer, and as it was subjected to the most severe tests before being placed before the trade, its worth has been proven in advance.

E. H. Hammond and E. L. Bates, well-known cut-glass salesmen of New York, have started the manufacture of a new lamp, which is the creation of Mr. Hammond. Much is being claimed for the new proposition.

Considerable interest is being manifested in the approaching meeting of the National Lighting Fixture Association, which was formed last year at a meeting held in Detroit.

There is no reason why the modern plumber should not get after and secure the contract for lighting the new buildings and homes he has secured to do the plumbing work in. This is a good side line, and, as many plumbers have found out, it has paid them handsomely.

SEWAGE IRRIGATION AT BERLIN, GERMANY.*

By Robert R. McCormick, President of the Sanitary District of Chicago.

I went to Berlin to study the engineering aspect of its sewage farms, but found that the engineering aspect was inextricably confused with the political and governmental conditions of that great city. The Berlin farms, over 40,000 acres in extent, are used to provide land for the landless and employment for the unemployed. They also act as a poorhouse and jail. To these farms is sent the sewage of Berlin. With upward of 10,000 people located there for reasons of public necessity the cost of labor does not have to be figured in the cost of purification of sewage on land. Thus, while Berlin is almost identical with Chicago in population, its sewage problem and that of Chicago are in no wise comparable. In the first place Chicago embraces a territory of 185 square miles; the area of the city of Berlin is only twenty-five square miles, making a remarkable concentration of population.

Begin Sewage Irrigation.

Located on the river Spree, a sluggish stream flowing through a valley four miles wide, two-thirds of the total area of the city is found in this valley, and the average street level of that part of the city is only about ten feet above the surface of the river. To that extent Berlin is somewhat like Chicago. The flow of the Spree is small in ordinary weather; in periods of excessive drought it is a mere brook. The prevailing condition made a system of sewage disposal absolutely necessary. A scheme to intercept the sewage on either side of the river and convey it below, to discharge it after some treatment into the Spree, was abandoned, and in 1873 the city council decided to employ sewage irrigation as the best method of disposal. The carrying out of this plan has led to the development of the largest sewage farm anywhere existing.

The topography of the city and the high level at which the ground water stands has made the method of collecting the sewage somewhat peculiar. It has been found expedient that each of the twelve drainage districts into which the city has been divided should have its own pumping station, whence the sewage is lifted to the sewage farms, located on the high ground to the north and south of the valley, the heights of which are some eighty and fifty feet respectively above the river. The cost of this pumping I did not obtain. It must be enormous.

Has 40,000 Acres of Land.

The farm lands have been purchased and are owned by the city and from a beginning in 1874 of 2,000 acres now amount to upward of 40,000 acres. The total sewage disposed of during the year 1908 averaged 75,000,000 gallons a day, which was delivered upon about 14,350 acres, or about 5,200 gal. an acre a day, and was derived from about 2,137,034 population, at the rate of about thirty-five gallons a head. The water consumption per head being about twenty gallons, the remaining fifteen gallons are due to rainfall and other sources.

Upward of 400 acres are held in reserve as filtration areas, upon which to discharge excess of storm water in summer. These are arranged in plots of from five to twenty-two acres each, surrounded on all sides by embankments about three feet in height and, under the name of tanks, serve in winter to receive the sewage when the surface of the irrigation fields may be so frozen as to prevent filtration through them.

Say Fish Thrive in It.

The effluent from the arms is purified to such a degree that as a rule it passes off clear and transparent, and we are told that fish thrive in it. The sanitary condition of the Berlin farms is reported as being very satisfactory, and the health of the people good, although a large number of them are from a class of petty delinquents, such as our tramps, whose habits of life are not favorable to health. The general salubrity of the farms may be further inferred from the fact that four homes for convalescents, with 286 beds in all, have been established on the farms and are supplied with water by wells sunk on the spot.

Death Rate Greatly Reduced.

A most interesting and important fact connected with the improved sewerage of Berlin is found in the greatly reduced death rate which has attended the development of the system.

Upward of $23,500,000 has been expended on the sewer system in the city of Berlin, including the twelve pumping stations, force mains and machinery. The sewage farms and the property, including buildings, forests, improvements and under-drainage, represent a total investment of $16,250,000. From this, the city received a gross income of about $125,000 in 1909. This comes from the leasing of the land, sale of vegetables and cattle. The real estate has appreciated in value, so that from the financial standpoint the result is good.

Sewage Farming Not a Success.

From a sanitary standpoint, even though the soil is sandy and loose, there is the great objection that too much water is added for the most successful farming and too little for economical sewage disposal. Sewage farming at Berlin is carried on more successfully than in England, but it cannot be said to be an unqualified success. The area required for the treatment is enormous. Sewage farming is hardly suitable for any climate except the arid regions, where sewage has a water value. Contrary to popular belief, sewage has little manurial value, and, therefore, it seems ridiculous to add a large dose of water to land already sufficiently watered by nature.

The leading sanitary engineers of Germany consider the sewage farm method of purification antiquated, but inasmuch as the farms existed primarily for the employment of labor there is no prospect of abandoning them for a more simple and modern method.

*Reproduced by courtesy of "The Chicago Daily News."

YE OLD TIME PLUMBING DAYS.

By W. H. Prescott.

"Purty busy to-day, Bill?" inquired the Old-Time Plumber of Harry Farrel's foreman, as the latter began loading the wagon preparatory to leaving for a job.

"Yes, good and busy."

"Glad to hear it, Bill; glad to hear it." Then, turning to the seedy-looking man, with a pink proboscis, seated on a discarded water-back, the Old-Timer said: "Do you know, when I hear that trade is good it reminds me of the good old days—the hot-stuff period of plumbing. Did I ever tell you about Chino, a master-plumber friend of mine? That was forty years ago, son—and them was the harvest days for the plumber. Chino, you know, had a push-cart plumbing-shop and traveled all over.

"'Business won't come to me; I'll go to business,' said Chino. You see, he was a kind of Mahomet philosopher: mountain won't come to you, why, go to the mountain; see? Go to blank, too, for all I care. Well, Chino struck the Pennsylvania route one summer, and say, he simply made dough and had the time of his life. Up at Reading a guy stops Chino and his push-cart plumbing establishment and says: 'Say, you have a sign on your gig: "Plumbing done while you wait." Now what the blank does that-a mean?'

"Chino took a pull at his fire-water bottle and answered: 'Well, you see, my cuckoo-faced friend, it's this-a-way: If you hire me to do plumbing you'll wait until the job's done, won't you?' 'Sure, Mike,' assented the inquisitive Readingite. 'Well, then,' says Chino, 'while you're waiting, I'll be doing the plumbing. See? It's dead easy. Get

"Want Your Joint Fixed?" "Me No Savee!"

up, Dobbin!' and cracking his finger-joints, Chino pushed on until the next guy asked him the same question about his sign.

"In North Reading a business-looking man called to Chino and said, 'Want a job? Well, there's a Mongolian down street and he wants his joint fixed. Go on down and fix him up. He runs a laundry.' Chino reached out and hit the place and, sure enough, there was an almond-eyed Celestial knocking the lint out of a dollar-shirt with washtub, lye-water and wash-board.

"'Hello, Wun Lung?' says Chino, 'I hear your joint's out of gear. Want it fixed?'

"'Me no savee!'

"'Your joint, you bilious-looking washwoman! Your joint; want it fixed?' says Chino.

"'Me no keepee opium joint.'

"Chino saw he had been sold and with a 'Ha! ha! ha!' laugh you could hear a mile he went out to his push-cart, seized a hammer and began pounding blue blazes out of a big long piece of gas-pipe. The noise he made was fierce, boy—and it got on the Chinaman's nerve.

"'What for you do that?' inquired the washee-wash man.

"'Never mind me,' says Chino. 'I'm just "hitting the pipe," Wun Lung.' And then he roared in high glee for another five minutes.

"Up at Hazelton, in the coal-mining section, Chino went broke, got hungry, and finally went in to swap one of his tools for a good square feed. 'Ill swap this metal punch for a meal,' said Chino to the cowboy-like hash-house owner.

"'I don't need it,' says the ham-and-egg chef.

"'What!' says Chino, 'don't you punch holes in your meal tickets?'

"'Naw,' says the ham-and sport, 'I shoot 'em out!'

"Chino got a move on. On the road to Allentown he hired a helper. 'I'm just out of college," says the helper, 'and mamma will be awfully glad if you'll take me along and teach me how to join those iron things there—with long holes in them—and how to fix bawth tubs and all that, you know.'

"'Glory be to William Penn!' says Chino, swallowing his chew, 'what the blank am I up against now? Well, come along, Willie; I'll be a godmother to you all right.' Willie was given a chance to shove the push-cart. Say, did you ever push a cart with a heavy load on through a country road with two inches of dust on it? Say, boy, if you have kidney trouble, you'll know it, all right—all right. Chino and Willie, his helper, reached Farmer Kon's place, and out in the lot was a good big prize bull, and soon's Willie seen him he says, 'Oh, see the pretty cow! I just love cows; I'll go over and pet her.'

"Chino stood on the second rail of the snake-fence to see Willie pet the cow.

"'So, boss,' chirruped Willie, as he reached out to pet the cow.

"Three minutes later, after the farmer and a crowd had arrived, Chino whips out a bandanna and, wiping real tears away, said: 'Yes, farmer, he was my plumbing assistant; was worth fifty wheels a month to me. Pay me fifty and I'll settle the case. You can bury him over there—under the bamboo tree.'

"As he pushed into Allentown Chino sized up his stack of greenbacks and said, 'Gee! that was the easiest fifty I ever made in me life, and Willie did all of the hard work! The Lord bless little Willie!'

"There was a big chemical plant at Allentown, next door to a tavern, and Chino got a job at the chemical place right away. The tavern backed right up against the chemical plant and Chino, peeking through a cellar window, saw the beer-pipes close to the window. 'Hully gee!' says Chino, 'this is a cinch—wait 'til night!' He had the beer-pipe tapped in no time and had half the night-force at the chemical plant seeing all kinds of things.

"'Long about midnight the Dutchman running the hop-castle said: 'Mein Gott! I draw vun beer and it's give out already yet. Vell, I go down and tap another keg.' And he did. And when the rosy flush of dawn arrived

Chino was paralyzed in his push-cart bed, the second keg was empty, and Hans, the tavern-man, was being strapped to a bed—plumb bug-house, for fair.

"'Look out for that barrel over there, Chino,' says the chemical-plant foreman that day, "it's full of croton oil.'

"Chino went in and offered to tap a new keg of beer for the Dutchman's wife, who was at the bar, seeing as her man was looney, and he then connected up the beer-pipes with the croton oil barrel; put on his force-pump and squirted about four gallons of oil into the beer. Then he disconnects, loads up his tools, gets his pay from the chemical man and yells out: 'It's noon, boys. I'll treat. We'll all go 'round to Fritzys. Round they went, ten or more, and Chino set em up.

"'Ding-danged funny tasting beer,' says one chemical fellow.

"'Right ye be,' says another, 'tastes like a charnel-house.'

"Chino headed for Easton and left the boys seeing things and acting nervous-like. Next day that chemical

"Darling I Am Growing Old."

plant was shut up tight and every doctor in Allentown had all the work he could attend to.

"In the suburbs of Easton Chino went up against a kittenish, 40-year-old girlie who stopped him and said: 'P-L-U-M-B-E-R! Oh, are you a plumber? How nice! Now, do you know, you're just the man I need. My pipes are all stopped up.'

"Rain drops poured out of Chino's face. 'Glory be to William Penn!' he groaned. 'Now I am up against it. Well, Mrs. ——' 'Oh, I'm Miss,' says the Old Maid. 'Miss Beatrice, if you please, and—' 'Well, where do you want this pipe-job of yours done—in the house or out here in the yard?'

"'In the house, of course, you stupid little fellow, you. The pipes from the creamery leak and I want them fixed. See? Come right along with me and I'll show you where they are. I'm here all alone, now—mamma's gone to town—but I know you'll be kind, now, won't you?'

"'Sure thing, Be-trice,' said Chino. 'Show me the pipes!'

"Soon he's seen 'em he said: 'Dead snap! I'll wet-nurse this job!' And he did. He used the Old Maid's kitchen-stove to melt his lead, and while it was melting he and Beatrice went into the library and sitting-room and parlor and Beatrice showed him pa and ma and Johnny and Lizzie, all in the album, and, by invitation, Beatrice played Chino 'Darling, I am growing old' on the organ in the parlor, and by request Chino, in a yell-milk-up-a-dark-alley voice sang the song, rolled his eyes, pressed his hands to his heart and Beatrice was his'n. It was all so tender and nice—such a cinch that Chino was able to chalk up eleven hours on the pipe-job, got a good warm supper and kissed Beatrice a tender good-bye ere he pushed into Easton. Aye, boy, them was the good old days of plumbing! They're gone—gone—never to return!"

BOOST YOUR TRADE PAPER.

In addressing the Advertisers' Club of Cincinnati recently, Mr. W. A. Stanger of Chicago declared the trade paper to be one of the greatest trade factors in modern business, says "The Circulation Magazine." He cites the fact that the trade paper has difficulties of its own and is a powerful force creating the demand with the retailer, and while it has a restricted circulation by being kept out of the hands of the consumer, it nevertheless gets closer to the people that read it than any other class publication.

Mr. Stanger points out the fact that the trade paper is the paper that the retailer reads as the devotee reads his Bible, and claims that to the retailer it is the only means he has of getting an unbiased view of what is going on in his field. He holds that thousands of circulars and elegantly printed advertising matter circulated by a manufacturer among its dealers has a certain effect, but the mere fact that it proceeds from jobber or manufacturer has a tendency to belittle its influence and importance.

Continuing, Mr. Stanger stated that the retailer looks to his trade paper to learn the facts and secure really reliable information in reference to various lines of merchandise, to the market conditions, and to all other divisions of his business. The trade paper is the medium of introducing the new things to the retailer who serves the interests of the consumer, and in this way it is the greatest commercial force known.

An order from a retailer is worth many orders from individual consumers. The dealer buys in quantities and sells in single pieces; thus advertising through a trade paper, while it does not produce numerically as many returns as general advertising, each individual order represents a quantity of steady buying, whereas the average consumer ordering goods through a magazine advertisement orders once and probably never again.

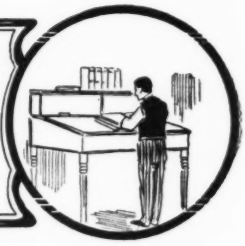
The trade paper is the best booster that the salesman of today possesses.

No matter whether a man is on the street, on the road or behind a counter, the trade paper is working for him day and night. It is inspirational and is the medium of expression for his views and for the interchange of ideas. It helps the road man because it introduces his goods to the prospective buyer before the salesman reaches him. In this way it lessens his task and prepares the way, so that the salesman has less trouble in finding the grounds on which to meet him. It also boosts the men who do things, and helps them both with their employers and their customers.

The trade paper is the cement that holds the business structure together, and every man in business should be a booster for the trade paper in his line.

BUSINESS MANAGEMENT

NEW METHODS FOR OLD



THE DAY OF SECRETS IS OVER.

Editor "Domestic Engineering":—Your questions in October 22nd issue, concerning hardware, plumbing, steam-fitting, tinwork, etc. As you will notice by our letter-head, **we plead guilty.**

We found it necessary to take up all these lines of work to satisfy the requirements of a small city. People in villages and small cities are building modern homes; about 100 of such are being built in our city. They all require hardware, some tinwork, and possibly some plumbing. A few want hot-water heating plants installed. By combining these we find our business properous, whereas the hardware-men who have neglected such work have found it hard sledding. Many have failed in business, even those whose methods seemed good. The reason for such failures must be lack of sufficient demand for goods in a small community. A poor hardware-man should be as zealous to promote organization and the consequent advantage it brings to wage-workers as any other individual. The fact that their efforts must tend to increase the demand for plumbing and heating must eventually result in a great benefit to the craft.

As to trade-school men, they can learn the work after getting on the job possibly quicker than the average apprentice. Wiping joints, owing to the rapid changes in material used at present, does not make them infallible. The best man is the practical **reading and thinking** working man; one who keeps posted **up-to-date** by reading "Domestic Engineering" and other available trade-papers. He must be endowed by nature with some mechanical skill, honesty, and of good habits. Such a man will forge to the front in any community. The people are quick to recognize merit or to condemn shiftlessness. There is a narrow-gage fault existing among the craft—prompted by egotism, selfishness and conceit. Had this fault not existed trade-schools might not have been in such demand. It is our duty to impart freely the knowledge God has given us and thus aid our brother-craftsman and society in general. **The day of secrets, selfishly held, is over**—the trade-schools and trade-journals have upset such doctrine. The writer has worked with the tools for over thirty years and realizes there is much to learn yet. I have often been under obligations to fellow-craftsmen for information which I needed and have always been willing to reciprocate through the trade-papers or otherwise whenever opportunity offered.

Let us put away the besetting sin of selfishness and unitedly engage in the up-building of modern, sanitary plumbing and heating of homes. Yours fraternally,

Montevideo, Minn. Geo. H. Claggett.

THE QUESTION OF DISCOUNTS.

Editor "Domestic Engineering":—I very much wish that you would print this letter, as I should like to see what some of the others in the business will say on this subject. It makes me exceedingly hot when I have a good-sized job to figure, to have to monkey with all the discounts that are given. Of course, I know that a list can be arranged that will make matters easier, but when you get many different notices through the course of the year as to a change of the discount it is not so easy to keep track of them. They are apt to slip by when you are not looking. I refer especially to the practice of having several discounts on one article. For example, take any certain article. We will say that the list is $28.00

Now the discount might be 70-10-10-10-5.

I never could see the use for any such monkey work and would be glad to have the expression of others on this subject. "Question."

Chicago.

INFORMATION ASKED FOR.

There are several different ways of advertising both yourself and the business, and some of these might be mentioned as follows:

1. Newspapers.
2. Personal letters and circulars.
3. Poster ads.
4. Your reliable goods and good work as told from mouth to mouth by your well-satisfied customers.
5. Your ad on theater curtains and in the street cars.
6. Your business advertised from your show windows.
7. Through the efforts of your mechanics.

We feel sure that you must make use of some (or perhaps all) of these methods and perhaps some that we have not listed. Which do you find to bring you the best results, considering matters from all standpoints?

DEACON DODGER COMMENTS ON "THE REAL REASON" BY MR. MOSS.

Editor "Domestic Engineering":—I see that Mr. Moss has taken up about a page and a half in a recent issue of your journal to talk about the remarks that I made about one of his previous articles in the paper. If I hurt his feelings by my levity I am sorry, though I think that a man who cannot stand a little good-natured "josh" is pretty thin-skinned to be in the plumbing business. We will pass that part of it up, and get down to "brass tacks" at once right here. He says that the prospective customer does not know the price of plumbing work. Perhaps not the work, but I contend that he (the customer) is fairly well-posted as regards the prices of goods. Maybe that is where Mr. Moss and I fail to understand each other. How can the customer help but be more or less wise as to the goods, when he can hardly pick up a newspaper of any real note but what he sees the "ad" of some mail-order house? If Mr. Moss does not know how extensive the "ads" of such firms are it will pay him to look over the magazines and daily papers once in a while.

Suppose that an architect should call for bids on a bathroom for a certain party and the bid to go to the lowest responsible man. Do you not think that the party who was building the house would know the size of the various bids? A man asks any plumber to figure his bathroom. The plumber puts in a bid of $250.00 for an ordinary bathroom. Do you not think that a very ordinary

man would say that he could get it done for less? He would not say this on a guess either, for he would know something about the prices. Most people that I have come across all over an extensive area of several different states seem to have a pretty good idea of the price of plumbing fixtures, a much better idea than they are given credit for possessing. When a man's interest is at stake he will find out what he desires, and no one, two or three plumbers are going to keep the information from him.

I heartily agree with what Mr. Moss says in regard to the uplifting of the craft and business all along the line. There is great need of it, and the future plumber and fitter will have to be a much better man than was his father and grandfather. However, when he claims that the people are not pretty wise as to what the goods cost, I must differ with him, for my experience has convinced me to the contrary. "Deacon Dodger."

A DIFFERENCE OF OPINION.

Two of our esteemed contributors seem to have a decided difference of opinion as to whether or not people are anyways posted as to the price of plumbing. We refer to Mr. Moss and "Deacon Dodger." We assume that you have read their letters to this paper. How does the matter stand in your vicinity? Have the people any idea of what the goods cost, or are they intensely ignorant in this matter? We would be glad to hear from you upon the subject. Don't let Mr. Moss and the "Deacon" occupy the entire floor. There must be others who have ideas upon the subject and some suggestions to offer. Let us hear from you soon.

HAULING DONE ON THE EUROPEAN PLAN.

By "North Dupont."

Most of the readers of this paper know what is generally meant by the European plan in connection with hotels, but probably do not know or have never heard the word European plan used in connection with the plumbing or heating business. Now for the benefit of those that do not know what European plan means, I wish to state that it is simply this: You pay for what you get and you don't pay for what you might be able to get and don't want. Now to get down to the European plan for the hauling end of the business. I wish to say that quite a few have adopted this plan and all like it and would not go back to the old way of having one horse and wagon, and a boy or man for driver.

Now to get down to the actual expense in both cases—the old plan and the European plan. Under the old plan you invest $200 for a horse and $100 for a wagon and harness. You have an investment of $300, to say nothing about blankets or a sleigh or other things generally needed. Your man to drive the rig we will say costs about $50 a month; your barn-rent about $3 a month; your feed, bedding and shoeing about $20 a month; your depreciation and incidentals about $3 a month, and if you figure your interest on the investment of $300 at 6 per cent, this would add $1.50 a month more, which would bring your total cost for hauling up to $77.50 a month, and then it is safe to say that during the busy months your one little wagon and horse would not be able to do all the hauling and you would be compelled to hire an extra rig for a few trips, which would probably add during the busy months from $10 to $25 a month, according to the amount of business being done and the distance of the hauls. To sum up the whole thing under the old plan, your hauling with your one rig, and an extra hired rig once in a while, probably costs you about $90 a month the year around, or $1,080 a year, to say nothing about the time lost in having your men on one job wait until Mr. Teamster comes back from the job he is on. Of course, some of the old planners will say that they have the use of their teamster for other work when he is not busy teaming, but as near as I have been able to find out, this other work he does don't amount to much and it comes nowhere near making up the time that is lost waiting for your "rig" to come back.

Another thing: Suppose your horse should die—what then? Buy another one, of course, and start all over again. But why take all the risk and still pay a high price for your hauling? Why not let some reliable transfer company do this work for you and let it take the risk? And you save on your actual hauling probably $40 to $50 a month. No lost time waiting for the rig to come back. Suppose you want a big load of lumber hauled, and it is a long haul; you get a two-horse rig, say, at eight o'clock, and the trip, we will say, takes 3 to 4 hours. Then suppose another one of your men at nine o'clock wants some pipe, boiler or closet bowl and fittings right away. You get another rig—a one-horse this time—and get the goods to the job in a short haul, which takes probably one hour for the whole trip, going and coming. You have had no lost time and your bill from the transfer company for this work will probably be $2.60, and you have taken no chances and had no lost time. This beats the old way, doesn't it? There are quite a few plumbers in some of the large cities in Minnesota that hire all their hauling done and don't keep a horse or wagon at all. Some of them even have the use of automobiles at times, and I have been talking to different concerns about the cost of this European plan, and one concern that does quite a business told me that their hauling for last year cost them a trifle less than $30 a month. Their business has increased quite a little this year and they say their hauling for this year will probably run $35 to $40 a month on an average. The most they have paid out in any one month this year was $63, and the smallest amount in any one month $12.50. Their bills for other months have been between the two amounts mentioned.

Another plumber who does not as much business as the one that I have just told you about says his hauling bill will probably average $20 a month. Still another concern that does both plumbing and heating pays for hauling on the average about $30 to $35 a month, and so it goes. None of the concerns mentioned keep a rig, nor would they use one if you made them a present of a horse and wagon and they had to keep it. The new way saves money, time and worry. Why not try it, Mr. Plumber?

STEAM-HEATING AND VENTILATING ENGINEERS MAKE A MOST IMPORTANT AND GRATIFYING DECISION.

At the meeting of the Chicago Steam-Heating and Ventilating Engineers at their hall, 722 Schiller Bldg., Chicago, on November 1st, a most important step in the emancipation of the trade from the evils attending sub-contracting was taken. The decision was reached that on and after Jan. 1st, 1911, the members of the association would no longer figure on buildings as sub-contractors. Now, if all the plumbers and steam-fitters follow suit in this regard, there will be fewer hard-luck tales in the convention lobbies and more prosperity among members of the two trades. The sub-contracting evil must go.

"How Do You Estimate?"

By A. J. Purcell, C. E.

You have read articles on estimating before. You have never read anything as comprehensive as this. Mr. Purcell takes up a definite case and carries out the estimates therefor along erroneous and right lines of calculation and shows the difference. You can check up every item and tell whether you are on the right track or whether your business methods need revising. "Domestic Engineering" furnishes complete estimate-blanks for plumbers and steam-fitters at exceptionally low prices. When you have read this excellent article, tell us what you think about it.

If a prospective customer were to enter your office tomorrow and ask you to give him an estimate on heating and plumbing his 8-room house:

Plumbing to consist of a complete bath-room with tub, closet and lavatory, sink and range-boiler in the kitchen; boiler connected to the range;

A 2-part wash-tray in the basement-laundry, sill-cock at the front of house and yard-hydrant at the rear of house;

Hot water supplied to bath-room, kitchen and laundry-fixtures, cold water to everything, and furnished through a meter;

Pipe the house for gas in every room and halls, and for cooking in the kitchen;

Heating to consist of a hot-water plant, to heat all rooms and halls, but not the kitchen—

How would you proceed to submit him a contract-price that you would take the job for?

Would you figure that you could do it for so much per fixture, and so much per radiator? Or would you need to take some measures? And then estimate it out in detail.

Estimating is one of the vital parts of any contracting business, but I venture to state that it is conducted by over 50 per cent of the heating and plumbing trade today in a most haphazard method, which usually amounts to a plain guess.

And if you guess on one job, and seem to have come out all right, are you inclined to compare the new job to be done with the last one just completed, and **guess** that you can do it for a little less, or the same price, or a few dollars more?

Estimating is done in several different ways that have come to my notice in the past.

1—As stated above, to estimate per fixture or per radiator.

2—Is to figure the square feet of radiation necessary, and then base estimate on so much per square feet of radiation.

3—Is to figure out the square feet of radiation; then find net prices of boiler and radiators, freight, cartage, labor, sundries, then add so much per radiator for pipe, valves and fittings.

4—Is to do as above, except to measure up the main and check off the fittings on the main; then lump the branches to radiators as pipe, valves and fittings at so much per radiator.

5—Is to figure out the square feet of radiation at net prices, and also boilers, valves, floor and ceiling-plates, expansion-tank, thermometer, altitude-gage, boiler-covering, bronze and liquid, labor, freight, cartage, sundries; then the pipe, fittings and hangers are based at so much per square foot of the radiation to be used on the job.

This last method is fairly good for an approximately close and reliable estimate, if there is no outside piping to be considered, as from a boiler-house or from some central plant, as the pipe and fittings' estimate will hardly ever vary over two cents per square foot in 100 jobs. Of course, cost of materials, at the point the contractor buys, governs how much this will be, per square foot, and different styles of jobs will call for a higher or lower rate per square foot. Gas piping is usually estimated by the linear foot or by the number of outlets.

The estimate, based on so much per linear foot is very nearly correct, if its price has been determined, by keeping the actual cost of 25 jobs, and by taking an average of the whole.

The linear-foot price will include pipe fittings, freight, cartage, labor, sundries, overhead expense, and to this you should add your profit.

Laying of water-services, from the street-main to the inside of cellar-wall, is sometimes estimated on the linear-foot basis with good results, if you know your labor-cost and the nature of your soil.

The laying of sewer-tile is also handled this way in some places. Different prices are used for the different sizes. This applies of course to water, gas or tile sewer-pipe laying, in connection with trench-work.

But after all is said and done, there is only one thorough business way to get up an estimate that you ought to be willing to sign your name to a contract for. That is the **detailed estimate.** It is accurate. It will show just what amount of material is to be used, according to the plans or premises. You can figure out your freight and cartage correctly, which is too big an item to guess at. Especially so, if you are doing business in the Middl West, West or Southwest, where the hauls are long and rates are high.

This then leaves you with your labor as the only thing to guess at. And when your bid is submitted, you can have that feeling, that no matter where you stand when the bids are opened, that you had the right price in, according to the way you estimated to install the job.

Whereas any other method might find you the lowest of 10 bidders or the highest. Besides that, a feeling of doubt will sometimes pop up as to whether you left out something or else got too much in. "Any way it didn't average up like some you had done, or you wouldn't have been so far out," is the way you figure it out, and try to excuse yourself for your bad break.

While, with the other way, the guess is eliminated. **You know.** In figuring on a plumbing job, the detailed estimate is the only sane way to figure on the job.

Every foot of soil-pipe, every pound of calking lead and oakum, all soil-pipe hooks, soil-pipe fittings, lead bends, waste-pipe, solder, ferrules, cleanouts, screws, bolts, water-pipe and fittings, putty, pipe-cement, stop and wastes, gasoline, closets, tubs, lavoratories, sinks, trays are to be considered. All fixtures to be figured complete to the wall or floor with supplies, waste, traps, bibbs and cocks. To these must be added the range-boiler, sill-cock, yard-hydrant, pipe-straps and hangers, freight, cartage, sundries, overhead expense, labor, car-fares and profit.

A printed form covering the above details is easily and quickly filled out and leaves so little to be missed in an estimate, that it would practically amount to nothing.

Ditch-work should be handled in detail also and a place left for its estimate on the printed form, under the heads of water, gas, sewer, trenching. The details of this would be pipe, fittings, cement, permits, tapping, lead-connection, curb-cock, stop and waste, meter, cleanouts, traps, manholes and covers, labor, freight and cartage, sundries, overhead expense, profit.

Gas-fitting can be detailed also, but unless on a very large job it is not so necessary. It is never a very large contract in an ordinary house, usually anywhere from 12 to 30 openings. If there are 50 or more openings, then a detailed estimate would be advisable and the following heads allowed: Pipe, fittings, straps, gas-cocks, joint-cement, freight, cartage, sundries, labor, overhead expense, profit.

Heating by steam or hot water can be fairly well estimated to cost a certain sum for ordinary small dwellings, and an approximate idea of estimation can be gained for all buildings, based on the cost per square foot of radiation necessary to heat the building, taking an average of from 50 to 100 jobs of all kinds, under about the usual conditions. Each job must be of the same class, as hot water or steam, gravity or vacuum.

A hundred jobs will show a good profit in some cases, and a loss in others, while the total result would be a fair profit. Thus the contractor would not be a loser on the whole. He would be as well off as if he had made his regular profit on each contract, as he figured to and expected to do.

On the other hand, some of your customers paid more for their jobs than they should and some others got theirs for less than cost. Also you lost some jobs because you were too high, and got some that were of no profit to you.

A detailed estimate would have given every one a **square deal** and have prevented any losses. The detailed items of a heating estimate would read like this:

Boiler, square feet of radiation, radiator-valves, union radiator-elbows, air-valves, floor and ceiling-plates, sleeves, expansion-tank, generator, altitude-gage, thermometer, water-supply valve, main-supply and return-valves, blow-off-valves, hangers, pipe, fittings, nipples, covering, bronze and paint, bronzing liquid, pipe-joint-cement, sundries, labor, overhead expense, profit.

All of these can be on printed forms, one for hot water and one for steam, as suggested above for plumbing, with the result that nothing will be left out.

The only thing in the whole estimate that need to be left to a guess is the labor, and this is a guess pure and simple. But if the estimator is observing, and has a complete record of his jobs executed at hand, and knows his workmen and their ability, he ought to make a pretty good guess.

We will now proceed to see how these different methods of estimating will work out in practice, using the above-mentioned 8-room house as an example.

It is to be a strictly first-class job, using all guaranteed material, with medium-priced fixtures. We will first start with the plumbing and estimate it by the fixture, as the job is just an ordinary one, of which the shop has done dozens in the last 10 years.

There are 8 separate and distinct fixtures, counting sill-cock and hydrant, which apply in this case, sewering 110 ft., water-service 50 ft. All trenches are to average 3 ft. deep. Gas put in by the gas company to inside of cellar wall. Job is about a mile from the shop. Water-meter furnished by the water company.

We think we can do this job for $50.00 per fixture, therefore, we make a bid of $400.00.

We will do the gas-piping at a dollar an opening, of which there are 12. One in each room, 1 in the bathroom, 2 in the halls, 1 in the basement. So our total bid is $412.00.

We will now proceed to estimate this same job in detail.

Fixtures will cost us		$127.00
Soil-pipe		25.63
Soil-pipe fittings		4.01
Galvanized-iron pipe (for vents)		5.76
Galvanized-iron fittings (for vents)		1.25
Pig-lead and oakum		9.56
Lead bends, ferrules, waste pipe and solder		4.92
Galvanized water-pipe and fittings		19.37
Stop and wastes, lead connection and curb box		7.68
Sewer and tapping permits		5.25
170 ft. of water and sewer trench, 3 ft. deep, at 10c per ft.		17.00
200 ft. gas piping, at 8c per ft.		16.00
10 days labor for plumber and helper at $5.00 per day		50.00
Total of material and labor		$293.92
Sundries	$2.00	
Freight on 1,500 lb., at 36c per 100 lb.	5.40	
Drayage on same	1.50	
	$8.90	8.90
Total		$302.82
7 per cent overhead expense		21.20
Total cost		$324.02
25 per cent profit on materials	$52.73	
15 per cent profit on labor, etc.	16.97	
Total Profit	$69.70	69.70
		Bid, $393.72
Guess bid		$412.00
Detailed estimate bid		393.72
Difference		$ 18.28

This difference in this case does not amount to a very large sum. However, this amount has lost many a fair-sized contract in the past. Even a much smaller margin has lost a contract, therefore it is better to figure it out in detail, and be sure you are right.

And right here is where I want to call attention to the method of adding profits to an estimate, showing where the overhead expense comes in, and helps pay for the time spent on the estimates you didn't get pay for. Also adding profits in one lump sum, as is the usual way, say 25 per cent of our total cost, less the overhead expense, we have.

Total cost	$302.82
25 per cent of this is	75.71
Total	$378.53

Making a difference between the two methods as follows:

Detailed profits and overhead-expense method	$393.72
With lump-sum profit of 25 per cent	378.53
Difference	$ 15.19

And you really get but 20 per cent actual profit, where you expected 25 per cent with the last method. The first method shows plainly on the face of the estimate what the profit is; in this case, a fraction less than 18 per cent So you are not having any false notions as to what your

profit is to be, if you have estimated your quantities correctly.

Also, if this bid had been guessed at on the basis of six fixtures, at $50.00 per fixture, not counting the sill-cock and hydrant, equal to two fixtures. Our guess bid would have been $312.00. And our profit if we had good luck would have been $9.18.

We will now proceed to take up the different methods of estimating a first-class hot-water plant for this house, using a radiator in every room and two in the halls, making a total of 11. As the house is an average house, and we have done many like it, we will guess that $50.00 per radiator will give us a fair profit, so we put in a bid to the owner of $550.00.

Now let us take our pencil and figure this job out a little more in detail, and see what results we will get.

All radiation is to be 38-in. high, no covering to be figured except for boiler. Covering of pipes is to be an after-consideration.

Using the second method mentioned, we find that our radiation figures out about like this:

First Floor—	
Parlor	65 sq. ft.
Hall	100 sq. ft.
Living room	96 sq. ft.
Dining room	100 sq. ft.
Kitchen	50 sq. ft.
	411 sq. ft.
Second Floor—	
Hall	64 sq. ft.
Chamber No. 1	88 sq. ft.
Chamber No. 2	96 sq. ft.
Chamber No. 3	72 sq. ft.
Chamber No. 4	64 sq. ft.
Bath	16 sq. ft.
	400 sq. ft.
	411 sq. ft.
Total radiation	811 sq. ft.

Figuring this on a basis of 80c per sq. ft. installed, 80c equals $648.80. Which is the bid we would put in on this method of estimating.

Using the third method, we find that our figures would read like this:

811 sq. ft. hot-water radiation	$143.06	
1,350 sq. ft. hot-water boiler	108.06	
Pipe and fittings and valves	66.00	
Sundries	5.00	
Cement	2.60	
		$324.72
Labor, fitter and helper	$ 72.00	
Freight and drayage	37.19	
		109.19
		$433.91
Overhead expense at 7 per cent		30.38
		$464.29
Cost of material, $324.72; add to this 25 per cent	$ 81.18	
Cost of labor, freight, etc., $139.52; add to this 15 per cent	20.93	
Total profit	$102.11	102.11
Contract price		$566.40

Profits are 18 per cent of the contract price.

If we were to add 25 per cent to the cost of job, and not consider the overhead-expense account, we would get the following results:

Cost of material	$433.91
25 per cent of cost of job	108.48
Contract price	$542.39

This offers to do the job for $24.00 less money, and appears to be giving us $6.57 more profit.

But what is going to pay our overhead-expense? The extra $6.57 surely will not. Then it must come out of our profits, which is bad business and poor system. And the 25 per cent in this case is only 20 per cent profit of the contract.

The fourth method shows up like this:

Boiler	$108.06	
Radiation	143.06	
Pipe, fittings, valves on radiators	44.00	
Pipe and fittings on main	43.31	
Sundries	5.00	
Cement	2.60	
Cost of material	$346.03	$346.03
Labor, fitter and helper	$ 72.00	
Freight and drayage	37.19	
	$109.19	109.19
Cost of material	346.03	
	$455.22	
Overhead expense, 7 per cent	31.87	31.87
	$487.09	$487.09
25 per cent of $346.03	$ 86.51	
15 per cent of $141.06	21.16	
Total profit	$107.67	$107.67
Contract price		$594.76

The profit on this contract amounts to a fraction over 18 per cent of the contract price. While the 25 per cent added to the cost of job shows that the supposed profit is $121.77, the profit on the contract price is only 20 per cent and the bid reads $608.86. Which is $14.10 higher than the other bid, and might lose us the contract.

The fifth method would figure out like this:

Boiler	$108.06		
Radiation	143.06		
Valves, elbows, tank, etc	23.88		
Pipe and fitting	89.92		
Cement	2.60		
Sundries	5.00		
Cost of material	$372.46	$372.46	
Labor	$ 72.00		
Freight and cartage	37.19		
	$109.19	109.19	
		$481.65	
Overhead-expense at 7 per cent		33.72	
Total cost		$515.37	$515.37
25 per cent of $372.46	$ 93.12		
15 per cent of $142.91	21.44		
Profits	$114.56		$114.56
Contract price			$629.93

The profit on this contract price is 18.1 per cent of the contract price.

The sixth method is the detailed one and figures out like this:

Boiler	$108.00	
Radiators	143.06	
Valves, elbows, tank, gage, thermometer, plates, etc	23.88	
Bronze and liquid	3.50	
Cement	2.60	
Pipe and fittings (detailed)	75.75	
Smoke-pipe	4.00	
Sundries	2.00	
Cost of material	$362.85	$362.85
Labor	$ 72.00	
Freight and drayage	37.19	
	$109.19	109.19
		$472.04
Overhead-expense, 7 per cent		33.04
Total cost		$505.08 $505.08
25 per cent of $362.85	$ 90.71	
15 per cent of $142.23	21.33	
Profits	$112.04	112.04
Contract price		$617.12

The profit on this contract price is also 18.1 per cent of the contract price.

The table below shows at a glance what the differences are in the six methods of estimating:

Table of Difference.

	1st.	2nd.	3rd.	4th.	5th.	6th.
Total cost			$464.29	$487.09	$515.37	$505.08
Profit			102.11	107.09	114.56	112.04
Bid	$550.00	$648.80	566.40	594.76	629.93	617.12

It also shows why there is such a difference in the bids of five different contractors, all bidding on the same kind of a job.

The range of difference is from $16.00 to $100.00 on the contract-price, while the range in profits taken for the last four methods is only from $5.00 to $12.00.

Note that the first and second methods give us no idea as to what our cost will be or what our profits might be. We are simply guessing: **Does it pay?**

To use the detailed method and get the best results it is necessary that you have the **installing** cost-details at your finger tips in your **office**-files.

For instance: You must know what your labor has actually cost you on all the previous jobs you have executed, the actual cost of all material, right down to the putty and nails.

And last, but not least, you must know your percentage of overhead-expense for the last year. With the perfect knowledge of these three items, in connection with freight and profit, you are bound to be on the safe side in your bidding. Your only mistake, then, would be in taking of the quantities from the plan or leaving out something, if figured from the building direct.

To get at the details of material-cost and labor-cost, it is necessary to **systematize** the business up a little. There should be a stock-man, whose duty it should be to receive and send out all material sent to the jobs and see the balance is returned when complete.

The job is entered up on the contract-ledger as debit against the owner or contractor, whichever it may be, and all material returned is credited to the same account.

Then the bookkeeper can show the estimator what the difference was between the estimated and actual cost of job. From this one account there are several items that can be figured out as percentages, showing what relation labor has to cost of material, such as pipe and fittings to cost of fixtures or square feet of radiation, cost of job per square foot of radiation or per fixture.

An average struck on 25 to 50 jobs of all kinds and classes, each in its class, will be valuable information for any estimator and for the office.

Because from these items the boss can check the job up after the estimator has passed it to him for his O. K., or the adding of the profit.

Many a mistake in taking of quantities has been caught in time this way, because this data was handy, and the bid looked out of proportion in some respects.

Then the cost of labor and one man's ability to do more than another can easily be found out and kept track of. This is done by the use of a time-card, showing each man's day's work, made out by himself, and for his labor only; showing what job he was on on a certain date, what part of it he worked on and approximately what he did. For instance, this would show how many fixtures or radiators were set, how many feet of risers were run, how many feet of main-run, or branches, time on setting up boiler, getting main-measurements, cutting holes, covering, bronzing and painting, etc., etc.

This card must be in the office every morning by eight o'clock, except when men are out of town on work; then it is to be mailed every morning for the day before. It is then checked up by the superintendent or foreman. If O. K., it is then passed to the bookkeeper to be entered up in his pay-roll account and against the contract also. Then it is returned to the foreman till the job is complete, then filed with all other papers on this contract.

This much of a system gives the estimator very valuable information and he can guess closer on the amount of labor necessary to do a certain amount of work than by any other method I know of.

The "overhead expense and profits" items of any bid are matters for the bookkeeper and boss to determine.

The bookkeeper can get the overhead-expense from his set of books, and the boss can add to the profit he wishes to make, according to the size of the job. For it stands to reason that you would not put the same percentage of profit on a $100.00 job that you would on a $5,000.00 job. Also the time you could turn the job over in must count for something in deciding the profit.

One other part of the system, that is very necessary, is a printed estimate-form on which the estimate should be made. With this made up in the right form, there will be no excuse for leaving anything out of the estimate and a careful man will very seldom do so.

The above-mentioned system will look like a lot of work and extra expense for nothing to the average heating and plumbing trade, but I want to state right here, from hard-earned experience and knowledge, that it really does **pay big money,** both to the little fellow and the big one.

The writer knows of one case where the leaks stopped, by the installing of a stockkeeper, saved the firm $1,000.00 per year, besides the valuable time gained with the high-priced mechanics, in having everything in its place and ready for them to work with.

In closing this article, I want to call attention to the fact that while the different methods of estimating this one house do not show a very great difference in results, that such would not be the fact if we could have compiled the data of 25 jobs, because they would not all be as compact as this one. Strung-out jobs and jobs out of proportion, like store and office-buildings, vary greatly.

QUESTIONS AND ANSWERS

FOUR QUESTIONS SUMMED UP.

In the last two years there have been dozens of questions that come under the four heads, that we are going to give, and we shall sum up what seems to us the evidence for better practice as demonstrated from the best answers that have appeared from time to time.

1. Dropped hot-water pipes from range-boilers, sometimes called dipped pipes. This pipe frequently runs over a door and down at the other side. Sometimes drops directly from the top of the range-boiler through the floor and runs across the cellar to fixtures at various points. In such a case there is very likely to be a poor circulation or air may be pocketed unless a pipe runs from the top of the range-boiler, where the hot-water supply comes out. The connection at the top of the boiler had better be made with a "tee" and a pipe run directly up to an upper story that must be supplied.

2. Heating a range boiler that is located below the level of the water-back. This has been and can be done, provided sufficient head room can be obtained. It will not do to drop the hot-water pipe directly from the water-back to the range-boiler that may be located in the cellar. The hot-water pipe upon leaving the range-boiler should rise, and this rising pipe should be of greater length than the distance from the water-back to the range-boiler. Some power must be attained to make that circulation and the power is due to the difference in weight of the two columns, the hot water and the cold.

3. Side or top tap for the water-main. Should say that it was a matter of convenience, depending upon the depth the water-main was located, as compared with the depth that it was desirable to run the water-service pipe. Lead connection from corporation-cock to service pipe seems to be preferred.

4. Undesirable noises upon systems: first cause, too great water pressure; ease off the pressure by using a pressure-regulator or make use of the tank pressure. Second cause, too small pipe, unreamed pipe or stopped-up pipe. Make a cleaning and use some first-class pipe sufficiently large and of clean bore and see that it is reamed to the Queen's taste. Third cause, loose packings on the faucets; replace same with a first-class article which you have successfully tried out before. Lack of air-chambers, pipes poorly anchored or anchored directly to wood, or pipes vibrating from great velocity of the water, will be readily fixed by any man of any experience in the business.

THAT BURR ON THE PIPE.

Editor "Domestic Engineering":—In using the pipe-cutters, that I have, I find that quite a large burr is raised upon the pipe, which seems to make it very hard to properly catch the dies when they go to start the thread. What can I do to remedy this matter? E. L. G.

We would suggest, first, that you get a class of tools that will not do the things that you have mentioned. If it so happens that you do not feel able to do this, you are wasting time if you attempt to remove the burr with a hammer and cold chisel. We have observed fitters merely hammer down the burr, but this makes a hard ridge and the pipe will stand a good chance to "strip" under these circumstances. If you still cling to your idols (the old tools), the easiest manner of removing the burr will be to make use of a blacksmith's rasp, which will very soon remove the burr when you get used to handling it.

THE HOT-WATER CIRCULATION JOB AT ST. PETERSBURG, FLA.

Editor "Domestic Engineering":—I wish to make a few suggestions regarding the hot-water circulation job installed at St. Petersburg, Fla., by C. J. G. I enclose herewith a sketch, Fig. 1, which shows how I would fix this job. I would be sure to have the return or circulation on grade and reduce the size instead of using a check

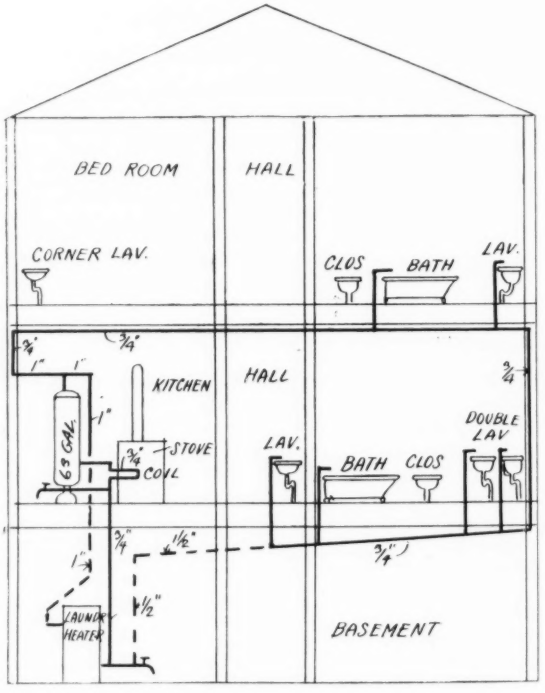


Fig. 1. How the Petersburg Job Can Be Cured.

valve. I am quite sure that a 1-in. pipe, cross tee and connection into side and top of boiler will give a rapid circulation and also plenty of hot water for the storage tank. The cold water tube should be of brass and all pipes should be reamed carefully. I have looped work in this manner several times and the results have always been satisfactory.

By reducing circulation-pipe size you increase the pull on the circuit in the right direction. By having flow-pipe only 1-inch size you will secure a more rapid flow of water into the storage tank, as the heat expansion will then have a chance to do quicker work.

Freedom, Pa. Seg.

WHAT IS THE MATTER WITH THIS DRAWING?

Editor "Domestic Engineering":—I am sending you a drawing (See Fig. 2) that I made some time ago, and it does not seem to be satisfactory. Will you be kind enough

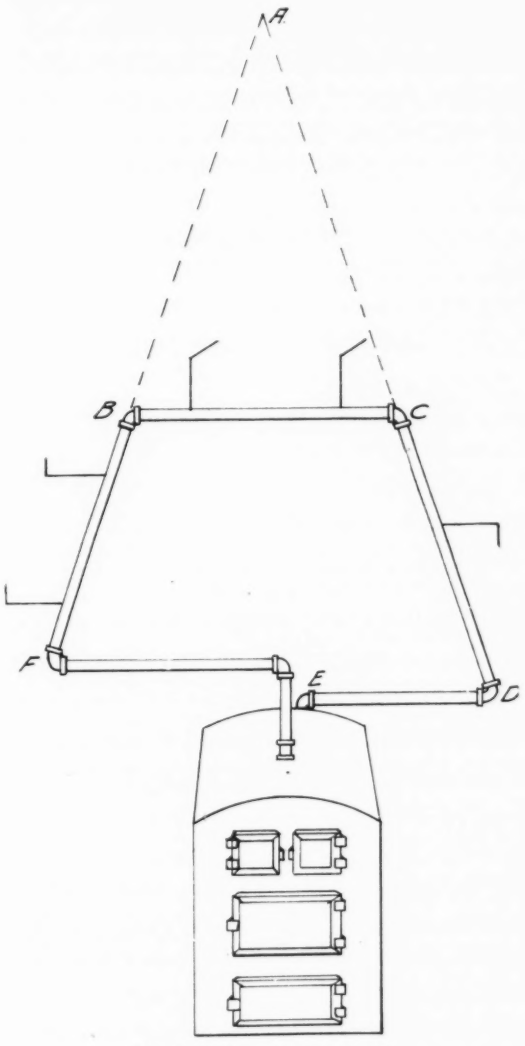


Fig. 2. What's Wrong Here?

to publish the same and see if anyone can give me any suggestions upon it? Hopeful.

We publish the drawing, to which we have added a few lines to render the matter more suggestive, and trust that some who have sent in such excellent drawings in the past year will give "Hopeful" a lift over the hill of difficulty, that seems to make life a burden to him at the present time.

THE THREE QUESTIONS ONCE MORE.

Editor "Domestic Engineering": Deacon Dodger's answer to "Hucem's" questions in the September 27th issue seems to me to sound as though the deacon had a grouch and was sore about something.

He certainly must have heard of such men as C. B. Ball, Thomas S. Ainge, J. J. Cosgrove, R. M. Starbuck, John R. Allen, Henry B. Davis, and many others, all good men and true, and I don't think he meant to say things just as he wrote them.

My definitions would be as follows:

1. A sanitary expert is one who has learned his trade thoroughly in every detail, and can execute any piece of work he is set to do with the tools perfectly, and knows how and why he does it the way he does; also just what it will do when he gets it done.

2. A sanitary engineer is one that is all that the sanitary expert is, besides having been versed in all the technical knowledge that applies to sanitation.

He is able to work out a system in theory. Then he can go to the drafting board and make a design of it; next, he can superintend the installation of it, so it will work in practice, as theory said it would.

3. This is a different proposition. Inspectors are taken from all walks in life; some are doctors and some ex-plumbers, town or city officials, and many are politicians.

An inspector, should be thoroughly posted in the principles of plumbing, and should be perfectly honest and have good judgment.

Little Rock, Ark. A. J. Purcell.

NOISY SUPPLY-BOILER.

Editor "Domestic Engineering":—We have, this last week, encountered a domestic-supply boiler, which, upon drawing water when the storage is good and hot, causes an unsteady, thundering noise practically throughout the entire residence, resounding along the water-supply lines. We wish advice entailing the theory of this phenomenon, desiring especially to know whether, in such a case, there is a possibility of the existence of air under pressure in the top of the boiler, resultant from expansion during heating to an extent over and above the water's absorbing capacity of air. It only acts in this manner when the water is very hot, and we will indeed be thankful if you can suggest a remedy for it. K.

Reading, Pa.

As the gentleman from Reading did not send in any sketch showing the way in which the job was connected we shall have to be somewhat general in our answer. Provided that the water-back and all pipes are free from all obstructing substances, from the description we might assume that the back was too large, or the range-boiler too small for matters as they now exist. If the boiler is connected so that it stands vertically, we should imagine that the steam, or air, would collect at some higher point than in the top of the boiler itself. If the pipes are dropped through the floor immediately upon leaving the top of the boiler, such a contrivance affords an excellent chance for this state of affairs. Again, if the pipes are all only half-inch and not reamed, they may not be large enough for the job. It may be that the water-back does not sit entirely level. Many plumbers are extremely careless in this respect and so here is another chance for the job to go wrong. If, as we at first stated, there is no stoppage of lime in the back itself, or the pipes between the back and the boiler, and the boiler itself is entirely clean, we should certainly look for some air-pockets on the job. Provided the owner does not want to pay for a new water-back and there seems to be too much hot water, the water-back may be plastered over with fire-clay, which will reduce its heating capacity. If none of these suggestions hit the mark, send us a more explicit description and a sketch and we will endeavor to go deeper into the matter.

THE HEAT UNIT.

Editor "Domestic Engineering":—Will you be kind enough to explain to me something about the heat unit? I see the thing mentioned very often in the paper and would like to have a better idea of it than I have.

Richmond, Va. H. T.

The heat unit may be called "the common-sense basis of all heating calculations." We must have something by which to measure. The druggist, the butcher, the hardware merchant, etc., all have their various scales, and there is no reason why heating work should be simply guessed at. A heat unit may be explained as "the amount of heat required to raise the temperature of one pound of water one degree Fahr.

QUANTITY OF GAS EQUALLING A TON OF COAL.

Editor "Domestic Engineering":—Will you kindly tell me the number of feet of gas that would be equal to the heating power of one ton of coal? I see that you have the faculty of covering a wide field in your "Questions and Answers," and I thought therefore that I would get the information about this from you. 99.

We find that some of the authorities state that about 25,000 cu. ft. of natural gas or 40,000 cu. ft. of illuminating gas are equivalent in heating power to one ton of coal. It is also stated that 1 cu. ft. of illuminating gas has a heating power of about 600 units.

AVOIDING NOISE WHEN HEATING WATER BY STEAM.

Editor "Domestic Engineering":—Am heating a large tank by live steam. There is too much noise made. Will you please tell me how I can do away with the annoyance? "Tank."

Use a specially devised steam-nozzle. This is so arranged that air is mixed with the steam and prevents the sudden collapse of bubbles and the noise of which you speak. When the steam is admitted without the use of such a special steam-nozzle, the bubbles will rise to the surface and then collapse, making the noise which is annoying you.

STOPPING THE LEAKS.

Editor "Domestic Engineering":—On a steam job where there are a few leaks and where it seems too great an expense to tear out any of the work, can you tell me if there is anything that can be put into the boiler that will stop them? J. K. L.

We would say that in the first place we would try and avoid having any leaks. This may look rather old and well worn in print, as we have made the remark before. It will work out all right with a sufficient amount of care. The writer has observed as many as ten consecutive jobs put in and never a leak on the whole string. However, in order to try and stop a few small leaks that give annoyance it may be found helpful to put a small handful of corn meal in the boiler and get up steam. In some cases where the corn meal was not handy ordinary oat meal may be used. There is no need of going on the plan that "if a little is good, more will be better"; for if you do, it is possible to get in enough to stop up some of the return pipes and make trouble. In certain instances the writer has seen horse manure used for this same purpose.

When it comes to making a complete and reliable job, however, it seems that a much better way would be to take a cold chisel and some soft copper wire, or a little tin foil, and caulk up the leak in a workman-like manner. While these other means may be used, the caulking is a dead-sure thing, if you do it right, and you can certainly so do, if you have read the columns of this paper, as you should have done for the past year.

RELIABLE COLD CHISELS.

Editor "Domestic Engineering":—For some time past I have had the deuce of a time with the cold chisels that I get hold of. They simply will not stand up to the work, and I would be very much obliged to you if you would give me any suggestion on the matter and the name of any firm that makes a first-class article in this line.

P. L. D.

Some of the cold chisels sold are nearly useless. However, all are not of that nature. We believe that, if you will examine the advertising pages of this paper from time to time, you will be able to find something which will meet your needs. Also if you can get hold of the partly worn-out chisels of some marble cutter and get them tempered by some one who understands how to do it, you will have a supply that will satisfy you.

DOES COLD-WATER SUPPLY NEED CHECK-VALVE.

Editor "Domestic Engineering":—Is it necessary to use a check-valve on cold-water supply to range-boiler to prevent hot water from reaching meter? Also is it necessary to install a relief-valve on hot-water pipe? In both instances, circulating pipe is run in basement.

Yours truly,

Winterset, Ia. G. B. K.

In reply to question regarding the meter would say that if the hot water reaches the meter a check-valve will prevent the water getting in. For purposes of safety a swinging check with a small hole drilled in the disk may be used.

Many plumbers use vacuum-valves for the purpose of a safety-valve. In some cases it may be necessary to make use of these features, but speaking generally we believe that the ordinary run of plumbing installations does not call for this class of practice.

APPRECIATES PICTURE PAGE.

Editor "Domestic Engineering":—We would be very much pleased to receive the blue prints of "Model Bath and Dressing Room" as shown on page 23 of your paper of Oct. 22nd. Please accept our thanks for your efforts to help the trade. Yours truly,

Daytona, Fla. Staples & Cutten.

ROBERT SPROUL DEAD.

Robert Sproul, of the plumbing firm of Sproul & McGurrin, Grand Rapids, Mich., died at his home in that city from a stroke of apoplexy on Monday, October 31. He was one of the leading and best-known master plumbers in Michigan, and the intelligence of his sudden demise will come as a shock to his many friends in the trade in all parts of the country.

A PRACTICAL MANUAL OF STEAM & HOT-WATER HEATING

BY EDWARD RICHMOND PIERCE

After reading this chapter and studying carefully the instructive tables GZ and HZ, you will be able to give a definite answer to Mr. Pierce's question—"Does the average catalog leave the engineer or the steamfitter with anything but a wild guess as to what the ratings may or may not mean?"

SECTION XXV.

The importance of having all these items in a catalog is clearly shown in Table GZ, which shows the results of an 8-hr. test based on the foregoing data, each item showing the results from each of the 6 different rates of combustion.

The rather startling differences in the various "conservative" ratings which the same boiler will afford when rated under different rates of combustion, (all of them within the possible range of good chimneys) indicates very sharply why great care should be exercised in the selecting of a boiler, to ascertain the condition of the chimney first, (See Sections 1 and 2 of this series, April 9th and April 16th, "Domestic Engineering", Subject—"Chimneys".) The strength of the draft may compel the use of a boiler rated with a stack-temperature of only 250 or 300 deg. if a satisfactory job is to be secured; or, the draft may be so strong that one rated under a stack-temperature of 600 or even 800 deg. F. should be used. It is true that the same boiler might be used in either case, as shown by table GZ. But an intelligent fitter would not put a boiler rated to carry 500 sq. ft. radiation under a stack-temperature of 550 deg. on to a chimney that would not develop a stack-temperature above 225 or 250 deg. for that boiler, and expect it to carry its rating. There is one other thing that can be developed from Table GZ. Item 10 shows the total capacity of the boiler to be 1,632 lb. of steam. If this was all to be condensed in 6 hours there must be 272 lb. condensed per hour, requiring a rating of 1,088 sq. ft. radiation, with no allowance for "conservatism".

If Item 10 is divided by the hours the boiler is to be run without attention, the gross rating of the boiler for that number of hours will be the result. Table HZ. shows another set of ratings based on the data developed by Table G.Z. Item 10.

From the facts developed in Tables GZ and HZ in regard to the ratings possible to be given any steam-boiler, and the vital importance of stack-temperature in the working out a rating, as well as the number of hours run when the rating was established—Does the average catalog leave the engineer or the steam-fitter with anything but a wild guess as to what the rating may, or may not mean? It should also be stated that these tables only contemplate an evaporation of 8½ lb. water per lb. coal and 3.78 lb. evaporation per sq. ft. heating surface. A given manufacturer may claim to evaporate 6, or 4, or 2, or 1½ lb. water per sq. ft. of heating surface. The value of that surface represented in radiator surface condensing ¼ lb. steam per hour would be, if the evaporation is 6 lb.

TABLE GZ.

Showing the different ratings the same boiler will require to comply with the evaporation secured at various rates of combustion and stack temperature.

Item 1-Stack temperature, deg. F.	750	650	550	450	350	250
" 2-Grate size, sq. ft.	3	3	3	3	3	3
" 3-Total heating surface, sq. ft.	54	54	54	54	54	54
" 4-Fuel to be burned, 4/5 total	192	192	192	192	192	192
" 5-Fuel burned in 1 hour. lb.	24	21.6	19.2	16.8	14.4	12
" 6-Fuel burned per sq. ft. grate in 1 hour. (Item 5 ÷ Item 2)	8	7.2	6.4	5.6	4.8	4
" 7-Lb. water 1 lb. coal evaporates	8.5	8.5	8.5	8.5	8.5	8.5
" 8-Evaporation per hour per sq. ft. of heating surface. Lb. $\left(\frac{\text{Item 5} \times \text{Item 7}}{\text{Item 3}}\right)$	3.78	3.4	3.2	2.64	2.27	1.88
" 9-Evaporation possible from total heating and grate surface. $\left(\frac{\text{Item 3} \times \text{Item 8}}{\text{Item 5}}\right)$	8.5	8.5	8.5	8.5	8.5	8.5
" 10-Total lb. boiler can evaporate from the full quantity of fuel to be used in test. (Item 4 x Item 9)	1632	1632	1632	1632	1632	1632
" 11-Total evaporative power of boiler developed in 1 hour. from fuel burned in 1 hour. (Item 5 x Item 9)	204	183	163	142	122	102
" 12-Total radiator-rating possible, based on each sq. ft. radiator condensing 1/4 lb. steam per hour. (Item 11 -:- 0.25)	816	732	652	568	488	408
" 13-"Conservative" Catalog-rating if 15 per cent is deducted from the test-showing, as a factor of safety.	694	622	554	483	415	347

per sq. ft. heating surface, 24 sq. ft. of radiator surface.

If the evaporation is 4 lb. the radiator capacity is 16 sq. ft. per sq. ft. heating surface. If the evaporation is 2 lb. the radiator capacity is 8 sq. ft. If the evaporation is 1½ lb. per sq. ft. heating surface the radiator capacity is 6 sq. ft. Therefore the capacity of a boiler claimed by the manufacturer to contain 100 sq. ft. of heating surface may be entitled to a rating of 2,400 sq. ft. of radiating surface; it may not be entitled to over 600 sq. ft. rating, or an evaporative value of 1½ lb. per square foot of heating surface, or it may be at any point between.

The present method of cataloging house-heating boilers does not enable one to come much nearer the real facts regarding the goods than a rough guess. If you guess correctly, you are satisfied. If you guess wrong, somebody suffers; usually the owner and contractor; once in a great while the manufacturer.

It may be claimed that as the catalogs all give the grate size, the guess can not be far wrong as to the correctness of the catalog rating. I am not raising the question of the correctness of the ratings. I will concede that there is not one boiler on the market today that is not correctly rated. But how it is rated, at what rate of combustion, or for how many hours' run without attention, or at what stack-temperature must it be run. All these vital points must be guessed at, until the manufacturers see fit to give out the items.

To illustrate this point. One boiler that has been on the market for a long time has a catalog rating of 500 sq. ft. The catalog says the boiler has 2¾ sq. ft. grate, and 84 sq. ft. of fire surface. The catalog of another equally popular boiler with a rating of 504 sq. ft. claims 3.6 sq. ft. grate. One very popular boiler now on the market and rated at 550 sq. ft. for steam, is claimed to have 3.2 sq. ft. grate and 41 sq. ft. of heating surface, while still another cataloged at 700 sq. ft. steam radiator capacity, has a grate surface of 3 sq. ft. and 45 sq. ft. of heating surface!

It will not require a long study of tables GZ and HZ, and the text which explains them, to realize that the present catalog-method regarding boiler-data, is like Carlyle's definition of axioms. "Words! Words! High air-castles cunningly built of words; the words well bedded in good logic-mortar; wherein, however, no knowledge will come to lodge." Each of the boilers just mentioned, is manufactured by a prominent concern of high standing The East, West and Middle-west are represented in the four boilers mentioned. If a contractor has to furnish a client a steam-job and the requirements are, that he shall supply steam continuously from 6 p. m. to 8 a. m. the next day for an average amount of 300 sq. ft. of radiation, will the data given as to either of these boilers give the contractor the slightest assistance in selecting the boiler? Suppose an examination of the proposed flue shows a weak, sluggish draft, so that only a very low stack-temperature can be secured, which boiler should he select, having only the usual catalog ratings to guide him? Here are 4 boilers each with practically the same grate surface relative to the claimed heating surface, each produced by very reputable concerns, yet none of them now give, nor have they ever given, in their catalogs, the data which can enable any one to make an intelligent selection in a case of this sort. Undoubtedly the reason for this condition lies in the fact that it is only within a very few years that the manufacturers of boilers gave up the practice of making the plans for all the jobs into which their product entered, and it was not thought to be good business policy to let the public know all about their goods. Each manufacturer stood behind his own goods with his personal garantee that the rating was a correct one, and each felt that that was all that the public need to ask. Under the old methods they may have been justified in taking that position. But now that they have thrown the burden of the garantee of the working of the boiler, and the job, on to the engineer or the steam-fitter, these latter have a just claim to be furnished **all the facts** in relation to the ratings of the boilers offered for sale.

TABLE HZ.

Showing the Gross Radiator-ratings Required to Condense the Steam Produced by a Boiler for Different Hourly Periods, when the Total Capacity of the Boiler from one Full Charge of Fuel is 1632 lbs. Gage-pressure 2 lb. Also "Conservative" Catalog-ratings for same.

Number of Hours to maintain the rating.	Pounds of Steam to be condensed each hour.	Total Sq. Ft. Radiator Surface Condensing 1/4 lb. Steam per Sq. Ft. to condense the Amount.	"Conservative Catalog Rate 85% of total.
6	272	1088	925
7	233	932	792
8	204	816	694
9	181	724	615
10	163	652	554
11	148	592	503
12	136	544	462
13	129	516	439
14	116	464	395
15	109	436	370
16	102	408	347

(To be continued.)

OBITUARY.

John O. Neilson, who for more than a quarter of a century was in the plumbing business at West Medford, Mass., died October 13th at his home on Sharon street in that city. Mr. Neilson was 75 years of age, was born in Norway and came to this country when 20 years old. He was a veteran of the Civil war.

James F. Dacey, who for 40 years conducted a plumbing establishment on Shawmut avenue, Boston, died at his home in the Charlestown district, October 16th, at the age of 82 years. Mr. Dacey was born on old "Fort Hill" and after leaving school was first employed on a newspaper. Later he served an apprenticeship in the plumbing trade and became a journeyman plumber. Later he entered business for himself, retiring a number of years ago after nearly half-a-century of successful business. He had lived in Charlestown ever since his marriage 60 years ago. He was twice elected a member of the old Charlestown city council, before Charlestown become a part of Boston, and after the annexation to Boston was in 1875 elected to the Boston common council. The funeral was held on October 19th at the home of his daughter, Mrs. Daniel L. Mahoney, 84 Ferrin St., Charlestown.

A PLUMBER'S DIARY

BY PHOENIX

XXI.

Making the Head Save the Heels.

Some years ago I chanced to be up near the 'Sketcha wan country, trying, by unlimited exertions to get a strangle-hold on a few "iron men." The words "unlimited" is used advisedly, while "near" is merely a blind. You see up there you work with the fear of Jack Frost at your heels all the time. Also I don't want any land agents going on a still hunt for yours truly.

One morning the owner of the shop, that I had favored with my presence, said to me: "You stay behind for a while and look over some plans with me. I have sent some of the other fellows on ahead with the tools and the boiler. I want to show you how I am going to have the job put in. The gang will not get to the place for several hours, and I'll send you to the place in plenty of time to help unload the stuff." So I staid with him and we had some very nice conversation. He was about "half shot" and as agreeable as a tom cat crossed in love. I enjoyed that visit hugely. If I had put the work in according to his notion, we'd had a worse job explaining things than certain statesmen have been having since Congress closed.

After the seance was concluded, he called up his team of "bronks" and had me driven out to the job, which was several miles distant and located in a hamlet that had slipped down behind the horizon. You can't see this town in the picture here given of the great stretch of northern country, but the road that I was driven over resembled this one in many ways.

So I thought I would have it in this article showing a strip of our Great Northwest. It didn't take the "bronks" long to hump themselves through the atmosphere to the little town at which we were to put in the steam job. We arrived about noon and found that the boys had just tackled the dinner, not yet having unloaded the boiler.

The wagon was pulled up in front of the store, however, and all was ready to start (in their opinion). I wonder why some people are foolish enough to build a cellar without an outside cellar door? Seems like there's "another one born every moment."

It was the case on this job and the fellows had it all laid out to cart that boiler through the store, working the sections, etc., down some very dark and winding stairs at the extreme back and then cart them back again almost the length of the cellar, to the place where the boiler should stand.

"A mighty good job if we get her down before dark, I tell you," said one of the fellows. "I'll bet some one get's smashed," croaked another. "Well, let's get busy," said the third; "this ain't getting us anything." "Hold on a little," I answered, "let's look the thing over before we start."

So I stepped around the place a bit and saw what they should have noticed, if they had been in the habit of using their heads. Up at the front end of the cellar, within three feet of where the boiler was to stand, was located a cellar window.

Of course it was not wide enough to admit the sections, any way you tried to work them in. But why not knock out a couple of feet of the cellar wall, remove the window frame and slide the sections down on planks to the very spot where they should be?

Say, it took me less than half an hour to knock out that wall. Then the planks were put in place and we had that boiler down in the cellar in less than another half hour.

The whole blamed job did not take up 60 minutes time, while a mason put the wall back to place in about two hours, as good as it ever was. I figured the thing out in dollars and cents one evening and found that the little bit of head work had saved the boss more than a 20-dollar bill, which same he put down (his throat).

This wasn't any particular brightness nor smartness on my part. Any person could have done the very same thing, **if he had stopped to think.** That is the very point I wish to make. Endeavor to make the head save the heels! These fellows were all drawing good pay, for they pay mighty good wages up in that country, while the work lasts, but every mother's son of them seemed to think that they had to earn their money by hard knocks and that the more they "sweat" the better returns they were giving the boss.

"Clydesdale" or "Percheron" steamfitters are no longer necessary to the game. They want 'em down in the 1:58 class, or may be a little better. "Horse sense" is worth much more than horse strength. The party, who takes pride in displaying his muscle and in juggling radiators to see them dance around, is the man who will always be doing just that, as long as his strength lasts. Pretty soon there will come a day when his back will go on a strike and then he will be down and out. I have seen just such fellows all over the country and so have you.

"A Strip of the Great Northwest."

Foolish men, to kill themselves just to show how strong they were. Better to have laid out the extra effort in acquiring a little wisdom. Think it over a bit before you go on the bum for keeps.

A SIMPLE RETURN-LINE VACUUM-SYSTEM OF STEAM-HEATING.

Suitable for Residences and Other Small Buildings.

By Emmons Collins.

For some time engineers have been trying to devise a simple return-line vacuum-system suitable for residences and other small buildings.

The usual forms of return-line heating systems require too much apparatus to be practical for a residence, both as to first cost and skill required to operate.

Another reason that vacuum-systems have not been more used in such buildings is that high-steam-pressure is not available for operating pumps and electric pumps are costly, noisy and troublesome.

The sketches herewith illustrate a new system which is comparatively simple. It will work as a gravity-system if the pump is shut off and as a vacuum-system when the pump is in service.

Fig. 1 shows a return-line vacuum-system supplied with steam from a street-main of a central-station heating plant.

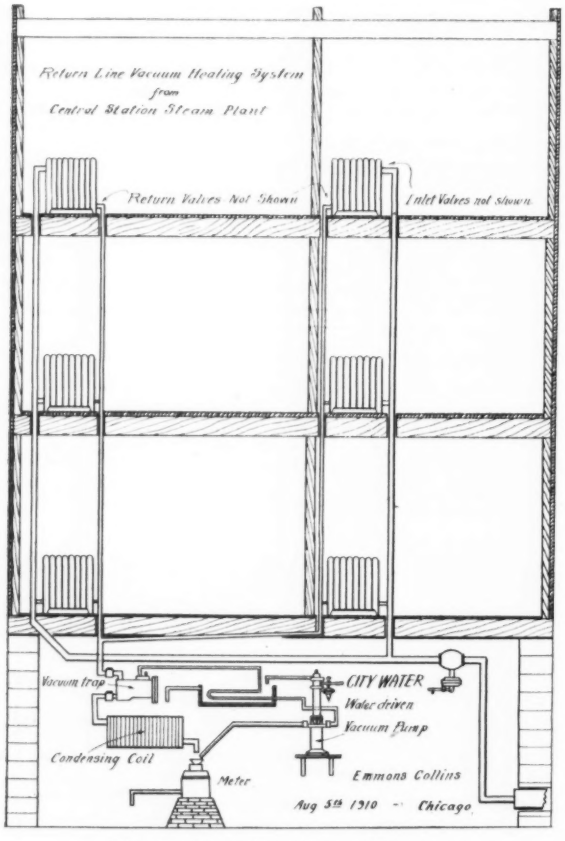


Fig. 1. Return-Line Vacuum-System.

Either type of radiator may be used, steam or hot water, and if the latter, the inlet-valve may be at the top and a graduated valve used. The return-valves should be of such a character that they will work when there is no vacuum in the return-line and also must be constructed so as to prevent steam from entering the returns and retain water in the radiators until it falls in temperature to about 180 deg.

It must be admitted that there is no perfect automatic return-valve on the market today and that cold water should be used to condense steam in the returns. The pump shown is operated by water from the city-mains and the water after (or before) passing through the pump is used for condensing purposes and thus the water is used in two ways to create a vacuum. The pressure of

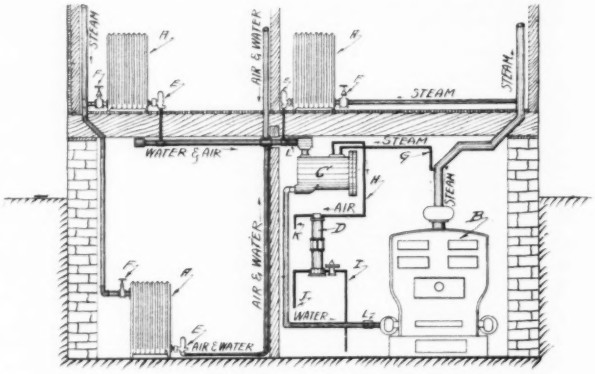


Fig. 2. Collins System of Vacuum-Steam Heating for Residences.

A = Radiator. B = Boiler. C = Vacuum trap. D = Vacuum pump. E = Vacuum valve. F = Radiator valve. G = Live steam-pipe. H = Vacuum air-pipe. I = Water-pipe. J = Water discharge. K = Air discharge. L = Check-valve.

the water actuates the pump-plunger and creates a vacuum by a mechanical means, also the steam in the returns, coming in contact with surfaces cooled by the same water, condenses the steam therein and this in itself creates a partial vacuum.

In Fig. 1 the pump creates a vacuum in the air separating tank or trap "C" (specifically shown in Fig. 2) and the returns leading to it will be under vacuum, thus the flow of water of condensation is accelerated towards the trap. When the water reaches a certain level in the trap a float rises and causes a valve leading to the vacuum-pump to close and at the same time a second valve opens the trap to the atmosphere, and the vacuum is destroyed in the trap, but not in the return-lines. The trap thus will discharge its contents to the drain, through the meter and condensing coil. The float falls and the valves are operated in the reverse direction and the vacuum-pump starts up automatically.

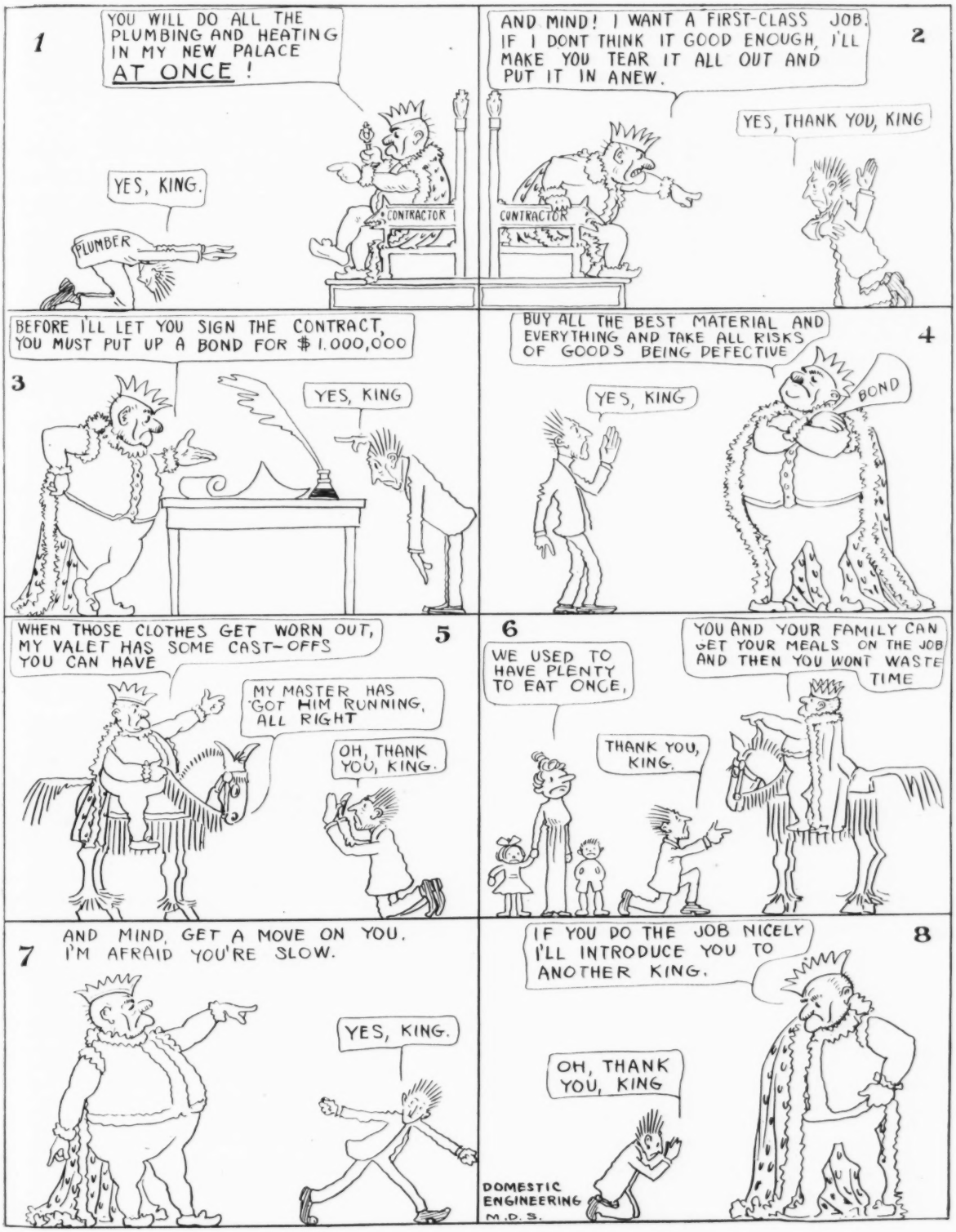
In Fig. 2 an individual boiler-plant is shown. In this case the second valve in the trap opens up to the live-steam pipe, the vacuum is destroyed and the pressure in trap and boiler are equalized, and the water of condensation returns to the boiler by gravity.

The cost of installing this system over that of a two-pipe steam job will be approximately $5.00 per radiator plus $250.00 on a new building containing up to 5,000 sq. ft. of radiation.

SIZES OF RETURN-PIPES IN STEAM-HEATING APPARATUS.

The article on this subject published in our issues of October 1st and October 8th was wrongly credited to Chas. A. Haeussler. Credit for this should have been given to the American Society of Heating & Ventilating Engineers, New York City. This society published it in its proceedings of 1906, as a paper read before it by James A. Donnelly, New York City.

"Domestic Engineering" Cartoon on "The Rewards of Sub-Contracting" No. X.


1
YOU WILL DO ALL THE PLUMBING AND HEATING IN MY NEW PALACE AT ONCE !
YES, KING.
PLUMBER
CONTRACTOR
2
AND MIND! I WANT A FIRST-CLASS JOB. IF I DONT THINK IT GOOD ENOUGH, I'LL MAKE YOU TEAR IT ALL OUT AND PUT IT IN ANEW.
YES, THANK YOU, KING
CONTRACTOR
3
BEFORE I'LL LET YOU SIGN THE CONTRACT, YOU MUST PUT UP A BOND FOR $1.000,000
YES, KING
4
BUY ALL THE BEST MATERIAL AND EVERYTHING AND TAKE ALL RISKS OF GOODS BEING DEFECTIVE
YES, KING
BOND
5
WHEN THOSE CLOTHES GET WORN OUT, MY VALET HAS SOME CAST-OFFS YOU CAN HAVE
MY MASTER HAS GOT HIM RUNNING, ALL RIGHT
OH, THANK YOU, KING.
6
WE USED TO HAVE PLENTY TO EAT ONCE,
YOU AND YOUR FAMILY CAN GET YOUR MEALS ON THE JOB AND THEN YOU WONT WASTE TIME
THANK YOU, KING.
7
AND MIND, GET A MOVE ON YOU. I'M AFRAID YOU'RE SLOW.
YES, KING.
8
IF YOU DO THE JOB NICELY I'LL INTRODUCE YOU TO ANOTHER KING.
OH, THANK YOU, KING
DOMESTIC ENGINEERING
M.D.S.

Oh, Thank You, King!

We are receiving requests from readers for reprints of these cartoons for framing. We will forward extra copies to subscribers for "Domestic Engineering" upon request.

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NOTICE TO ADVERTISERS.

Copy and cuts for advertisements intended for a particular issue should reach the office of Domestic Engineering on Monday of the previous week if it is desired that a proof of the advertisement shall be submitted. New advertisements can be received up to noon of Monday of the week of issue, but no proof can be shown.

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Member of the Federation of the Trade Press Associations of the United States.

SPECIAL NOTICE TO READERS.

Our readers are invited to send in articles on any topics covering sanitary interests as outlined above. **Photographs** and drawings with descriptions of special **interest** to plumbers and steam-fitters are welcomed. **"Domestic Engineering"** pays at space rates for all articles, notes, criticisms and news data so contributed.

Among the Wholesalers

WILL INCREASE ITS CAPACITY.

The Homewood Sanitary Pottery Co., of Mannington, W. Va., which now employs nearly 200 hands, will increase its capacity at an early date. The plant has 10 kilns, and it is understood that this is to be increased by the addition of two more kilns.

PITTSBURG WATER HEATER CO. BUYS LARGE TRACT OF LAND.

R. C. Frampton, president of the Pittsburg Water Heater Co., Pittsburg, Pa., has announced the purchase by his company of six acres of land at Idlewood station on the Pan Handle Railroad, six miles west of Pittsburg, and the new location of the company will be there. Three other towns were after the concern—Cleveland, Toledo and Detroit. Because of excellent shipping facilities and cheap fuel, the company decided to remain within the Pittsburg district.

WESTERN TRADE GOLF TO CENTRAL SUPPLY ASSOCIATION AT THE CALUMET COUNTRY CLUB, OCT. 27, 1910.

The Western Trade Golf Association held a special tournament in honor of the Central Supply Association on Thursday, October 27th, at the Calumet Country Club, Chicago. The event was a most enjoyable success in every particular. The official scorekeeper, Arthur W. Magill's, report of the day's doings follows herewith:

Qualifying Score.

E. S. Aitken	54	A. A. Ainsworth	59
J. W. Watson	42	F. M. Bailey	50
W. C. Matlack	54	W. E. Clow, Jr	42
R. R. Sterling	47	J. P. Dugger	55
H. E. Pursell	50	D. E. McCabe	49
J. F. Tuttle	51	L. S. Downe	52
E. Buehler	58	E. A. Stark	66
W. B. Dale	55	C. A. Burrell	62
Jas. MacLane	52	P. J. Frey	68
Andy McDonald	47		
Paul Blatchford	55		

Trophies of the Western Trade Golf Association Special Tournament in Honor of the Central Supply Association. From Photograph by A. W. Magill, Official Photographer.

Score by Flights.

First Flight.

J. W. Watson R. R. Sterling	R. R. Sterling 2 up & 1	R. R. Sterling 1 up in 12
W. E. Clow, Jr. Andy McDonald	A. McDonald 2 up & 1	

Second Flight.

D. E. McCabe J. F. Tuttle	D. E. McCabe 3 up & 2	D. E. McCabe 3 up & 2
F. M. Bailey L. S. Downe	F. M. Bailey 3 up	

Third Flight.

H. E. Pursell	H. E. Pursell	H. E. Pursell
E. S. Aitken	1 up	1 up
Jas. MacLane	W. C. Matlack	
W. C. Matlack	1 up	

Fourth Flight.

W. B. Dale	W. B. Dale	W. B. Dale
J. P. Dugger	2 up	1 up in 10
Paul Blatchford	E. Buehler	
E. Buehler	2 up	

Trophies of the Western Trade Golf Association's Special Tournament. From left to right they are: The Ainsworth-Apperson Jack-Rabbit Cup, won by H. E. Pursell, 3rd Flight. High Gross Score Cup, won by P. J. Frey. The Metal Worker Cup won by R. R. Sterling, 1st Flight. J. W. Watson Cup, won by W. B. Dale, 4th Flight. S. H. Moon Cup, won by A. A. Ainsworth, 5th Flight. The Sterling-Skinner Cup, Low Gross 42, won by W. E. Clow, jr. President's Cup, won by Paul Blatchford. President's Cup to Runner-Up, won by J. P. Dugger.—From Photograph by A. W. Magill.

Fifth Flight.

A. A. Ainsworth	A. A. Ainsworth	A. A. Ainsworth
C. A. Burrell	4 up	3 up
E. A. Stark	E. A. Stark	
P. J. Frey	1 up	

TRADE LITERATURE RECEIVED THIS WEEK.

The Keller Mfg. Co., Philadelphia, Pa., has recently issued to the trade a handsome booklet entitled "Plumber's Data Portfolio." This is designed to furnish by effective illustrations and accurate description a complete presentation of the advantages of the Keller-Duplex stationary vacuum-cleaner. All its different uses are plainly set forth and special instructions are furnished concerning the four classes of specifications which the plumber may be required to prepare, a copy of these specifications being supplied with the booklet. Those interested can obtain the "Plumber's Data Portfolio" upon application of the company.

The Standard Sanitary Mfg. Co., of Pittsburg Pa., is distributing to the trade an interesting booklet which describes and illustrates the "Standard" red-and-black-label baths. These are double-enameled and the material and workmanshhip are garanteed for two years. These are second in place to the well-known green-and-gold-label baths of this company and have been placed on the market to cope with a constantly increasing demand for a garanteed bath for good quality and durability at a moderate price. Four designs of the red-and-black label line in four different widths of baths and four different widths of rims are shown. A copy of this can be secured upon application.

NEW PLUMBING CODE PROPOSED FOR SALINA, KANSAS.

The city council and the master plumbers of Salina, Kans., will meet in the near future to consider and discuss the proposed plumbing ordinance which the plumbers have asked the city council to adopt. The provisions of the ordinance as drafted by the local plumbers will be taken up and discussed thoroughly by the members of the council, and while it may be that the council will not adopt the ordinance as drafted by the plumbers, a plumbing ordinance may be passed which will authorize the creation of a board of plumbing examiners, possibly of three members.

Section 1 of the proposed ordinance calls for a chairman of the board of health, who shall be an ex-officio chairman of plumbing examiners, one member of which shall be a journeyman plumber whose title shall be inspector of plumbing and one master plumber, the latter two to be selected by the city council for a term of one year. The duties of the board will be to designate the time and place for holding examinations of all applicants desiring to work as plumbers or to engage in the plumbing business, the meetings to be held at least once a month. Applicants to be examined as to practical knowledge of plumbing, house drainage and plumbing ventilation, and if satisfied with the competency of the applicant, authorize him to engage in or work at the business of plumbing either as a master plumber, employing plumber or as a journeyman plumber.

This provision means that any man who engages in the plumbing business must himself be a plumber, and this is one of the points to which objection has been raised. Section 1 also provides that a certificate shall be issued to a man who passes the examination and provides for a fee of $5 a year from a master or employing plumber, $2 from a journeyman plumber per year. The fees to be turned into the city treasury in the same manner as provided for the payment of licenses. In other words the ordinance establishes a yearly license for plumbers.

Section 2 of the proposed ordinance requires that any man now in the plumbing business shall pass the examination before he is allowed to continue in the business.

Section 3 provides the duties of the inspector aside from serving as a member of the examining board, and states that he shall inspect all jobs of plumbing done in the city after the passage of the ordinance and see that the work complies with the health rules as established by the board, and to issue a certificate showing a clean bill of health for the job, and file complaint against any man found doing plumbing work without first having passed the examination and secured a permit.

Section 5 provides that except in the case of repairs for leakages, every plumber must first have the permit and must pay 50 cents for each and every fixture or waste opening for future fixtures. All fees in this manner collected to be paid to the city treasurer, the same as the license money.

Section 6 requires every man working at the plumbing business to register his name and address with the plumbing inspector, and requires the master plumber and the employing plumber to deposit with the city clerk a surety bond of $500 to insure the city against injury to persons or damage to property.

Sections 8 to 10 designate just how every piece of plumbing work shall be done, including every kind of pipe and the sizes necessary to insure proper drainage.

Section 12 provides that nothing shall be construed so as to prevent any person, company or corporation from entering the plumbing business without passing the examination, provided such person employs none but journeymen plumbers. Master plumbers and employing plumbers are required to furnish a certificate of inspection free to owners or contractors of building.

AN IMPERIAL "COCK-OF-THE-WALK."

The cock-of-the-walk is supposed to be the chief of his particular territory and this is what the Imperial Co., Grove City, Pa., claims its new basin-cock is. This has several advantages which should prove attractive to plumbers. The "Imperial basin-cock" is placed on the market as a better and more convenient fixture than that in common use. One of its chief points is that it has a renewable seat-ring feature, which prolongs almost indefinitely the life of the cock, and dripping is eliminated. These basin-cocks close with the water pressure. To renew the worn rubber seat it is only necessary to unscrew the union nut, without shutting the water off at the stop-cock. Another advantage afforded by this new basin-cock is that it enables plumbers to use a self-closing cock on hot water and a compression on cold.

The "Imperial" Basin-Cock.

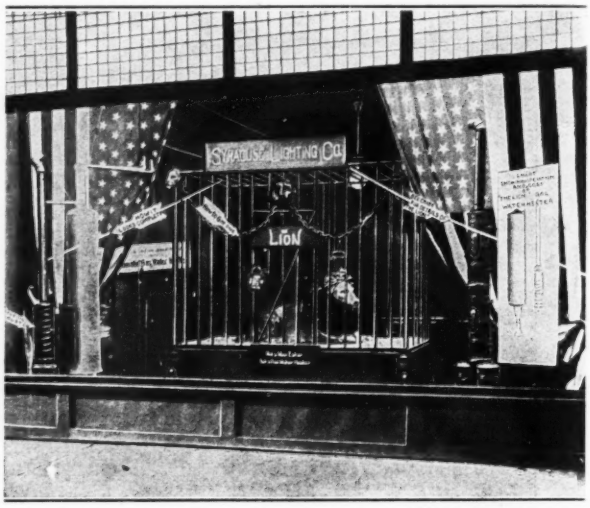
These advantages summed up may be presented as follows: Self-closing with high or low water-pressure. Removable rubber seat under water-pressure. Double ball-bearing construction. Self-packing around the stem.

Illustrations of this new addition to modern plumbing goods and complete description are furnished in a small booklet issued by the Imperial Co., which can be obtained upon request.

WHEN POLITICS DISRUPTED AN UNIQUE WINDOW-DISPLAY.

When the window-trimmer of the Syracuse Lighting Company of Syracuse, N. Y., evolved a unique window-display and injected into it some local—not to say national and political—color, he reckoned without Theodore Roosevelt and Vice-President James Schoolcraft Sherman.

The window-display was new; it was original. It displayed Lion water heaters, and the local color was a caged papier mache lion. As a finishing touch the originator



Unique Window-Display that was Disrupted by Politics.

hung a placard on the cage, inscribed, "T. R.'s Favorite." Hence the national color.

Everybody who saw it, stopped and took in every detail. The display was irresistible. But when Manager De Long caught sight of the placard, the trimmer's hopes tumbled like a cyclone-swept house of cards. Mr. De Long is a brother-in-law of the vice-president and about the time the display was perpetrated Roosevelt and Sherman were engaged in a lively bloodcurdling little tilt, entitled: "I'll be the temporary chairman." Sherman lives at Utica and De Long was, in a kinship and a political sense, very much for Sherman as ruler of New York's political destiny.

Mr. De Long forthwith ordered the placard to the scrap heap. The vice-president was his brother-in-law and kinblood or marriage will tell.

However, the rest of the display remained intact and the Syracuse Lighting Company benefited. It was decidedly novel and, being on exhibition during state-fair week at Syracuse, attracted thousands of pairs of eyes.

The principal feature in the window display was a huge, black cage, in which was incarcerated a full size lion—made of papier mache. The cage was supported at each of the four corners by "Lion" water heaters, manufactured by the Pittsburg Water Heater Company, and others were stacked to the right and left, big signs exploiting them.

On the door of the cage was a huge padlock, marked "$16.00," and conveniently suspended nearby was a large key, on which was inscribed, "It's up to you." The display was the subject of a great deal of attention from the people of Syracuse, and thousands of out-of-town visitors, attracted to the city because of the state fair.

It was particularly attractive and excited unusual interest because of the reference to Roosevelt. Then the placard came down. The rest of the display was so well gotten up, however, that it was still highly valuable from an advertising standpoint. It demonstrated the possibilities of showing off the good qualities of "Lion" heaters and undoubtedly resulted in many being sold in Syracuse and vicinity. It was just another evidence that no matter how good a product is, the public must first be enticed. After that the rest is easy.

THE METAL MARKET

FOUNDRIES BUYING PIG-IRON.

While there has been considerable buying of pig-iron during the last week, prices are slightly easier and it is the usual thing to secure iron for 1911 delivery at the prices formerly named for this year's. A feature of the pig-iron buying, which is rather peculiar, is the fact that the inquiries have come in singly and not in bunches as is usually the case. This gives the impression that the volume of business offering is much lighter than many believed. Some of the New England machine-tool builders are in the market. The United States Radiator Corporation, which has been in the market for a large tonnage for some time, has delayed placing its order. Virginia makers have shown a reluctance to sell for 1911 delivery. A large order was taken by a Chicago seller for a manufacturer of road machinery in Racine, Wis. Prices are as follows:

No. 2 Southern foundry, Birmingham	$11.00 to	$11.50
No. 1 Northern foundry, New York	15.75 to	16.00
No. 2X Northern foundry, New York	15.25 to	15.75
No. 2 plain, Northern foundry, New York	15.25 to	15.50
No. 2 Northern foundry, Chicago	15.35 to	15.85

OLD IRON.

Some more Panama scrap was sold last week at $9.35 f. o. b. cars. This was a reduction of about 80 cents compared with the lot sold a month previous. The demand for heavy melting-steel scrap shows an improvement. Prices are revised as follows:

No. 1 yard wrought, long	$13.00 to	$13.50
No. 1 yard wrought, short	12.00 to	12.50
Heavy-melting steel scrap	12.00 to	12.25
Machinery cast	13.00 to	13.50
Wrought pipes and tubes	11.00 to	11.50
Malleable castings	12.50 to	13.00
Wrought turnings	7.00 to	7.50
Cast borings	7.00 to	7.50
Stove plate	10.00 to	10.50
Light iron	5.50 to	6.00

LEAD.

The demand is slightly better and prices in St. Louis are up 2½ points. In New York the quotation is unchanged at 4.40 cents. Lead for prompt shipment, how- and as high as 37.50 cents.

SPELTER.

The market in spelter is exceedingly quiet, but prices are firm at 5.60 cents New York and 5.45 cents St. Louis.

FURTHER IMPROVEMENT IN COPPER.

The largest seller of copper has disposed of a goodly tonnage of copper to European consumers. There seems to be no doubt that sales made during this recent buying movement, which has lasted now for nearly three weeks, have been upwards of 50,000,000 pounds. European consumers have purchased freely and from the light stocks reported in the last fortnightly report, it is evident that they will be obliged to continue these large purchases. To the conservative interest in the copper trade the consumption of copper in Europe has passed all expectations and even now continues abnormal. Should the American demand spring up in like proportion the unwieldly surplus that had such a depressing effect on the American market would soon be disposed of. Lake is selling at 13 to 13¼ cents and electrolytic at 12⅞ to 13 cents.

TIN MARKET QUIETING DOWN.

The steamer "Minnewaska," which came in last week with 1,300 tons of tin aboard, relieved the situation to quite an extent. The Market has not been in the turmoil that it was and the premiums of one cent and even more for spot tin have disappeared. The market has been sent up so fast that all interests are distrustful of it, the largest sellers being reluctant to make any speculative commitments. The statistical position of tin, however, is very firm, and prices might be easily pushed up 5 cents a pound. Sales have been made this week as low as 35.75 and as high as 37.50 cents.

CELEBRATE RETIREMENT FROM PLUMBING BUSINESS.

A stag social to celebrate the retirement of James Munden & Sons from the plumbing business was given by the Master Plumbers' Association, of Allegheny, Pa., at the shop of Messrs. Munden & Sons at 1200 Arch street, North Side, on Thursday evening, October 27. The celebration was also in the nature of a farewell to Mr. Munden and his sons, who are removing to a farm south of Richmond, Va., and giving up the plumbing business for the joys of husbandry.

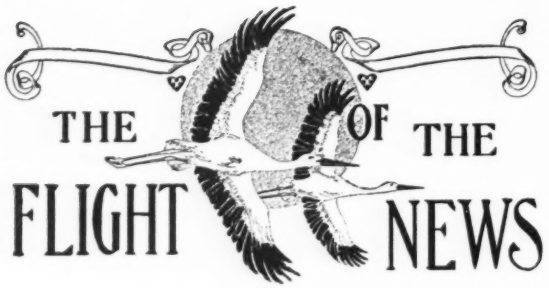
The affair was in the hands of T. F. Scanlon, secretary of the Allegheny organization, who was ably assisted by Charley Deer, A. J. Zilliox, Al. Whitehead and others. Music was furnished by the Royal Orchestra. There was an excellent luncheon served, and during the evening the stock of plumbing goods in the Munden shop was auctioned off by Tom Scanlon in a first-rate manner, which goes to show that if Tom was not a good master plumber and efficient sanitarian he could liven things up a bit in the auctioneering world.

There was a solo by James Munden, Jr., and then Tom Scanlon told a story which caused the welkin to ring about how the Germans in his neighborhood stole the Belgian block paving stones as weights for their sauerkraut.

There was plenty of excitement during the auction. Scanlon auctioned off a box of brass fittings which was bought by A. J. Zilliox, but Chris. Godfrey's overcoat happened to be on top of the box when the bids closed, so Zilliox couldn't see why the overcoat should not go along. Finally a couple of policemen straightened the tangle out. Then Charley Deer, Peter Raehn and Zilliox got into another argument, and the whole Third Ward poked its nose out of the window wondering what that awful racket was about. Finally peace was declared, and the auction proceeded to the end.

Those present included the following master plumbers: T. F. Scanlon, Charley Deer and Edward Ober, of the firm of Deer & Ober; A. S. Whitehead, Allan McFadden, of McFadden & Craig; Edward Cass, of the W. N. Sauer Co.; Frank J. Fleishel, A. J. Zilliox, T. R. Marshall, J. C. Godfrey, W. M. Zitman, of the Pittsburg Plumbing & Heating Co.; Peter Raehn, of the Raehn Co.; E. J. Maurhoff, of Henry Schleuning's shop; James Munden, retiring vice-president of the Allegheny Master Plumbers' Association, and his son, James Munden, Jr.

Mr. Munden is one of the old-timers of western Pennsylvania. He started in business over 30 years ago. The firm was formerly Munden & Tate, and was afterwards changed to Munden & Addy. Munden & Addy dissolved partnership in 1907, Mr. Addy going to a farm in California. The association of Pittsburg and Allegheny will miss him badly, as Mr. Munden was one of the most loyal and popular members of the organization and was widely known in the trade over the country.



NEWS FROM NEW ENGLAND.

John M. Gill, Waterbury, Conn, has the contract for the plumbing and metal work for the new stores being erected on Farm street, Waterbury, for W. H. Fudge.

L. T. Burns, Waterbury, Conn., has been awarded the contract for the plumbing in Gottfried Wagner's new house on Hill street in that city. The Barlow Brothers' Co., Waterbury, has just completed an extensive plumbing and heating contract in a two-family house which Mrs. Ida M. Benham erected on Willow street.

P. H. Garrity, 342 Main street, Waterbury, Conn., has the contract for heating the new picture-house which is being erected by John Wolzer on Bank street; for hot-water heating in the house of Gustavel Zebell on Second avenue, and for the plumbing in the farm-house of Mrs. Michael Mahon on Baldwin street.

William B. Bull of Lenox is installing a steam-heating plant in James Clifford's Sons' block in that city.

George Toppan & Co., Fairfield, Me., have been awarded the contract to remodel the heating system in the high-school building at Clinton, Me.

The work of installing a heating plant in Leavitt's new theater at Sanford, Me., is to be started in another week. The contract is in the hands of James Mullen, Sanford.

Michael M. Clark, Houlton, Me., has contracted with the plumbing firm of James H. McPartland for the installation of a heating plant in his residence on High street, Houlton.

Fire which is believed to have started in the basement of the plumbing shop of L. P. Carter at Bar Harbor, Me., on October 22, threatened for a time to wipe out the entire business-center of that famous summer-resort. The absence of wind, however, saved the village. As it was three buildings were destroyed. Carter's loss is estimated at $4,000, and was covered by insurance.

A fire in the cellar of the plumbing establishment of Hanlon & Murphy, 280 Asylum St., Hartford, Conn., on October 21st, gave the fire-department of that city a busy hour and resulted in a damage to the plumbing stock of several hundred dollars.

Joseph Brown, the Center-street plumber of Jamaica Plain, Mass., is building an addition to his residence on Seaverns avenue, which he intends to occupy as a plumbing shop when completed, transferring his business from its present location on Center street.

C. L. Parker, who for some time past has conducted a plumbing, heating and tinsmithing establishment in Hartford, Vt., on November 1st took possession of a building at the junction of North Main street and Fairview terrace, in White River Junction, Vt., where he will conduct the same line of business in the future.

Hammer & Brothers, Great Barrington, Mass., have been awarded the contract for the heating and ventilating of St. Peter's church and will begin work at once. This is the final contract in connection with the erection of the new church-building which will now be rushed to completion.

Charles Lawler, Stonington, Conn., is making arrangements to open a plumbing shop in the Hyde building on Elm street.

The new heating plant at the Rutland (Vt.) Federal building, which was recently installed by G. S. Blodgett Co., Burlington, Vt., has been formally accepted by the government and the contract price of $3,048 has been ordered paid.

The firm of Ralph E. Carter & Co., of Bangor, Me., has secured the contract for plumbing, heating and water-system in the new building which is being erected at Northern Maine Junction for the Eastman Heater Co., manufacturers of heaters for railroad cars used to move perishable products.

Yeggmen raided the National Bank and several stores in the town of Amherst, Mass., on the night of October 21, among the stores being the establishment of the Mutual Plumbing & Heating Co. The latter's loss was slight.

Daniel Donovan, Middletown, Conn., has the plumbing contract for the new double house being erected by Joseph Esser on Evergreen avenue, South Farms.

The W. P. Kirk Co., Bridgeport, Conn., has the contract for the plumbing and heating in a house on Hazelwood avenue for W. H. Sanford.

The plumbing establishment of F. W. Loomis on Arch street, New Britain, Conn., was damaged considerably in a fire on October 21. The cause of the fire is not known.

Fiske & Flynn is the title of a new plumbing firm which has just gone into business at Middletown, Conn. The members are Charles L. Fiske and J. Taylor Flynn. They will do all kinds of plumbing, heating and general jobbing. They are located at 138 Washington St. Mr. Flynn will be the practical man of the concern, he having previously been engaged in the business here.

The E. A. Blanchard Co., Old Town, Me., has the contract for installing a hot-water heating system in the house of Charles Whittier at Passadumkeag, Me.

The O. F. Bennett Co., Haverhill, Mass., plumbers and steamfitters, has opened a branch establishment at Alton, N. H., where it will not only do plumbing and heating work but will also deal in stoves, furnaces and the like. The new branch is in charge of John Bennett.

PREPARING FOR SIXTH ANNUAL BANQUET.

The Master Steam and Hot-Water Fitters' Association of Newark, N. J., will hold its sixth annual banquet at Davis' parlors, 943 Broad St., in that city, on Wednesday, Dec. 7, 1910. The entertainment committee, consisting of Sol Berla, Wm. M. Whitlock and Robert Berla, is leaving no stone unturned to make the affair a pleasant success. Tickets are $3.50 each, and they should be secured before December 1, 1910, from Wm. M. Whitlock, 65 N. 11th St., Newark.

MANHATTAN MASTER PLUMBERS PREPARE FOR ANNUAL BALL.

The Manhattan Branch of the New York City Association of Master Plumbers has just issued invitations to its annual entertainment and ball, which will be held at the Lexington Opera House, 58th street, near Third avenue, on Wednesday evening, December 14, 1910. Every effort is being made to make the event the most enjoyable affair in the history of the association. The entertainment and ball committee consists of the following gentlemen: T. A. Hill, chairman; T. S. Cochrane, secretary; I. J. Brown, treasurer; Jas. P. Knight, Cuno Muller, F. B. Lasette, Jere L. Murphy, T. J. Tuomey, Geo. H. Creasy, T. J. Cummins and B. F. Donohoe. Tickets admitting gentleman and ladies (kindly note that this last word is plural) are $2 each and can be procured from I. J. Brown, treasurer, 155 East 55th St., New York City. The boxes will be auctioned off at the regular meeting of the association on Tuesday evening, November 15th.

CONVENTION DATES.

January 24, 25 and 26, 1911.—The 17th annual meeting of the American Society of Heating and Ventilating Engineers, in the Engineering Societies' Building, New York City. The officers of the society are: President, J. D. Hoffman, Purdue University, Lafayette, Ind.; first vice-president, R. P. Bolton, New York City; second vice-president, S. R. Lewis, Chicago; treasurer, U. G. Scollay, New York City; secretary, Wm. M. Mackay, 113 Beekman St., New York City.

February 6, 7 and 8, 1911.—The sixth annual meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers, at Milwaukee, Wis. The officers of the society are: President, W. G. Williamson, Detroit, Mich.; first vice-president, Edw. F. Kane, Wilmington, Del.; second vice-president, C. I. Putts, Jr., Baltimore, Md.; secretary and treasurer, Thos. J. Claffy, 215 Madison St., Chicago.

PACIFIC COAST LETTER

The recently organized Association of Master Steam and Hot-Water Fitters of San Francisco have joined the National Association and offices have been opened in the Monadnock Building on Market street, where the regular meetings will be held. A room has been secured adjoining the offices of the Johnson Service Co., and R. B. Lindsay, manager of the latter concern, is secretary of the new association. Many questions new to the local trade are coming up and these are now being discussed at the meetings to the mutual benefit of all the members. Practically all of the local firms interested in the heating business have become members, and those that have not are expected to join shortly.

There will be no attempt made this year on the part of the Master Plumbers' Association to secure the passage of a state plumbing bill as was thought possible some time ago by some of the master plumbers. There is no doubt but that, if a bill similar to the one presented last year, were placed before the legislature it would pass both houses, for the members of the lawmaking body made a thorough examination into the proposition last year and satisfied themselves that state regulations were needed. However, Governor Gillett has shown himself to be an enemy of the proposition and would probably see to it that the measure would be sidetracked as before. A new governor will be elected in November, and next year an attempt will be made again to secure the passage of a state plumbing law. Without a state law there has been a great amount of sanitary work undertaken by cities throughout the state during the past year, more in fact, than has ever been the case before in a similar length of time, but there are still some places that are badly in need of improvements of this character. These places are by no means confined to the country districts, for some of the suburbs and possessions of the large cities are in a deplorable state. The outlying districts of Oakland are a fitting example. Up to a year ago these places were independent towns and were preparing to install sewer systems, the sale of sewer bonds having been provided for. These places have since been annexed by Oakland and now the courts have declared the sanitary boards to be without power to proceed with the work planned. So far, the city of Oakland has taken no steps to provide these districts with sewers, as was promised before annexation, and feeling is running high. Demands are being made that something be done at once along this line for these outlying districts have been growing rapidly of late and without adequate systems of sewage disposal it is feared that an epidemic may result. The chief activity in the installation of sewer systems at the present time is in the towns of the San Joaquin and Sacramento valleys, and plumbers are moving to the country from the large cities where opportunities seem to be more favorable.

E. L. Culin, Pacific Coast representative of the Climax Sanitary Co., Detroit, Mich., with offices in the Hansford block, San Francisco, secured the contract for supplying the Newton J. Thorp Commercial High School building with Maxco seat-operating closets. Mr. Culin states that there are now over two hundred of these in use in San Francisco schools and that several other large orders are expected soon.

Work is being rushed on the installation of the pipe for the auxiliary salt-water fire-protection system and it will be but a short time before the first unit of this system will be ready for operation. There was quite a discussion among the unions at first as to who had jurisdiction over this work, but it is being done by the waterworkers instead of by the plumbers. The waterworkers have joined hands with the gasfitters and formed a strong organization and have succeeded in shutting out the plumbers. It is asserted that with the completion of this system there will be a reduction of 35 per cent in insurance rates.

Plans are being made at Long Beach, Cal., for the installation of an auxiliary fire-protection system, and that city will soon be in the market for a large quantity of cast-iron pipe and fittings.

D. R. Campbell, San Francisco, Cal., will shortly commence work on the plumbing of a residence building for Alexander Heynemann on Buchanan street, near Jackson, the contract being valued at about $2,000.

Kiernan & O'Brien, Inc., San Francisco, Cal., have been awarded a contract by Caroline Bush for the plumbing work in a three-story frame-building to be erected on Ninth street. The consideration mentioned is $1,225.

The Turner Co., San Francisco, has contracted to install the plumbing, heating and ventilating systems in the building to be erected by I. C. Jillson on Post street, near Polk. This work is to cost something over $9,000.

M. Levy, the Polk street plumber in San Francisco, has contracted to install the plumbing, gasfitting, sewering, hot-water circulating system, tanks and standpipes in the six-story brick-building to be erected by Rivers Brothers on Golden Gate avenue off Market street. The consideration mentioned is $12,420.

George Stoddard, a master plumber in Berkeley, Cal., is a candidate for election to the directorate of the Berkeley Chamber of Commerce.

J. D. Hooker, a jobber in steel-pipe and plumbing supplies of Los Angeles, was a visitor in San Francisco this week.

H. T. Sherriff, the Pacific Coast representative of Nye, The Die Man, has left for Southern California to spend a few weeks with the trade there.

R. S. Heaton, Paso Robles, Cal., is planning to erect a new building at that place to accommodate his growing business. He is in the East at present.

CONTRACTS AWARDED.

J. T. Hines & Co., Hutchinson, Kans., have secured the contract for the plumbing of the new bank building at Greensburg, Kans.

David Grewar Co., Nashville, Tenn., has secured the contract for the plumbing and heating in J. W. Blair's $50,000 apartment building in that city.

William Nord, East Main St., St. Charles, Ill., has secured the contract for the installation of heating systems in three new houses in Geneva.

John A. Dowling, Trenton, N. J., has secured the contract for the installation of heating and ventilating systems in the new school houses now being erected in Hamilton township. The consideration is $2,260.

O. L. Kern, Champaign, Ill., has been awarded the contract for the installation of a low-pressure steam-heating plant in the First Christian church at Urbana, Ill.

Daily & O'Brien, Peoria, Ill., have been awarded the contract for the plumbing of the new skating-rink building to be erected by Gauss & Covey at the corner of Fayette street and Jefferson avenue in that city.

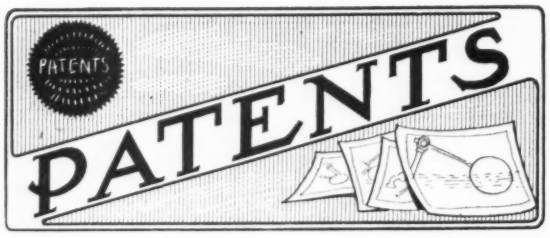
The Grand Island Plumbing Co., Kearney, Neb., has been awarded the contract to furnish and lay pipes to conduct steam from the boiler house of the Soldiers' Home at Grand Island to separate buildings of the home. The contract amounts to $5,813.20.

Millhench, Hobbs & Snyder, Norfolk, Va., have secured the plumbing contract for the Second precinct police-station.

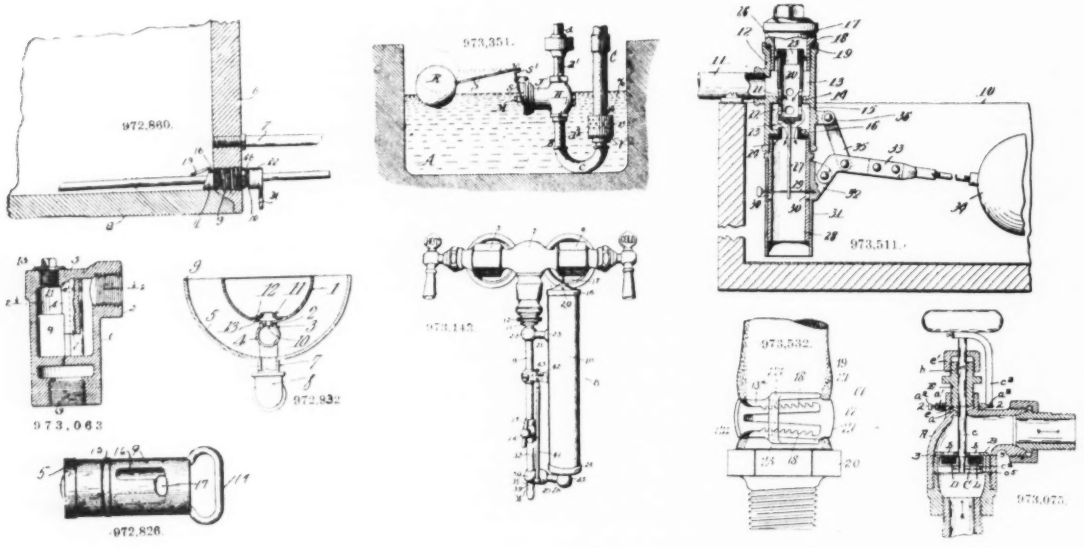
The Hub Heating & Plumbing Co., Newburyport, Mass., has been awarded the contract to install plumbing and heating systems at the Sacred Heart Parish school in Amesbury. This company has also recently received the contract to install a steam-heating plant in the Quincy block on Pleasant street.

W. C. Nichols, Slater, Mo., has been awarded the contract for the installation of heating and lighting systems in Mr. Daniels' new residence in that town.

The Galveston Gas Fitting & Plumbing Co., Galveston, Tex., has been awarded the contract for the installation of all the plumbing of the new million-dollar Hotel Galvez in that city.



973,826.—Faucet. Henry G. Cordley, Glen Ridge, N. J., and George R. Long, Waterbury, Conn., assignors to Scoville Manufacturing Company, a corporation of Connecticut. In a faucet, a tubular body portion; a valve seat within said body portion; a valve co-operating with said seat; a tubular valve operating member within said body portion and closed at its inner end and capable of longitudinal and of rotary movements within said body portion and to the closed inner end of which said valve is secured, the periphery of said valve operating member being provided with two cam grooves located opposite one another and each comprising a portion extending longitudinally of said operating member and a second portion extending transverse thereto; and a rod extending across said body portion and through both of said cam grooves, the arrangement of the parts being such that when said valve is upon its seat said rod will be within the transversely extending portions of said cam grooves.



972,860.—Drain-Pipe Inlet. William Hoteling, Oblong, Ill. A device of the character described comprising a tubular member, a valve carried by said member and constantly tending to close the bore thereof at one end, the other end of said member being reduced exteriorly and internally and forming a shoulder within the bore of said tubular member, threads formed on the outer face of said reduced end, a compressible annular member within said reduced end disposed against said shoulder and having the opening therethrough of less diameter than the bore of the member, a follower slidingly mounted within said reduced end for movement toward and away from said compressible member and having a length in excess of the distance from the outer face of the compressible member to the outer end of the reduced end of the tubular member, a cap mounted for travel on the threaded outer face of the reduced end of the tubular member and adapted to engage the outer end of the follower to slide same against the compressible member, and a handle carried by said cap for manually rotating same.

972,903.—Pipe-Wrench. Anthony A. O'Donnell, Springville, N. Y.

972,932.—Drinking-Cup. Andrew G. Sheak, Binghamton, N. Y. A drinking fountain consisting of a cup having an inlet opening, a frusto-conical nozzle over the inlet opening having a peripheral flange to engage the inner walls of the drinking cup and co-operate therewith to form a chamber to reduce the pressure and spread the jet from the inlet opening, and an overflow bowl without the cup and having its rim spaced from and extending beyond the rim of the cup to prevent the lips from being inserted onto the edge of the cup.

972,939.—Vacuum-Pump. Gray Staunton, Evanston, Ill.

972,975.—Automatic Safety Gas-Valve. Harry L. Young, St. Joseph, Mo.

972,063.—Radiator-Fitting. Thomas G. Mouat, Bratenahl, O. A radiator fitting comprising a casing having near its upper end an inlet connection and having an outlet connection below the inlet connection, a transverse partition extending partly across the interior of the casing above the outlet connection, a partition extending downwardly from the upper end of the casing to the transverse partition, a port being formed between the lower end of the latter partition and the former partition, the latter partition forming with the inlet connection a passageway for water of condensation, and a third partition extending upwardly from the first-mentioned partition and forming a valve seat, of a main valve for said seat, said valve with the said port and the other of which communicates with the outlet, and the second partition having a small vent located above the top of the third partition.

973,075.—Valve. Oliver Schlemmer, Cincinnati, O. In a device of the class described, the combination of a flat valve seat provided with a port, a rotatable disk valve having a port adapted to register with the port in the valve seat, a rotatable valve stem carrying the valve and having a connection with the valve which permits of limited rotary play between the stem and valve, and means for moving the valve toward and away from its seat upon rotation of the valve stem, substantially as specified.

973,143.—Attachment for Bath-Cocks. Edmun D. Snodgrass, Tillamook, Ore. In a device of the class described, a tubular section having a passage and further provided at its outer end with a passage of greater diameter than the first-named passage and disposed at right angles thereto, a nozzle having its lower end threaded into the last-named passage and provided with an elongated hollow nose spaced from the wall of the passage, a tubular nipple threaded into the opposite end of the passage and spaced from the nose and a reservoir connected at one end to the inner end of the said tubular section.

973,317.—Heat-Regulator. John H. Surridge, New York, N. Y.

973,351.—Automatic Drainer for Cellars, Etc. George Hoffman, Buffalo, N. Y. A draining device comprising

an upright discharge pipe, an enlarged straining chamber passageways or chambers one of which communicates connected with the lower end of said discharge pipe and provided in its walls with perforations, a tubular bushing of wood having a comparatively narrow upper part arranged in said discharge pipe and an enlarged lower part arranged in said chamber and having the lower part of its passage flared downwardly, and an ejector nozzle arranged centrally in said chamber below the lower end of said bushing and having an external annular flange which is connected by a screw joint with the lower end of said chamber.

973,424.—Water-Purifying Apparatus. John C. W. Greth, Pittsburg, Pa., assignor to Wm. B. Scaife & Sons Company, Pittsburg, Pa., a corporation of Pennsylvania.

973,511.—Supply-Valve. Nelson B. Johnson, Webster, Mass. The combination with a supply valve casing having a valve seat, of a main valve for said seat, said valve being hollow, whereby water may be discharged therethrough, there being sufficient space between the valve and casing to permit water to leak from the supply into the valve chamber above the valve when the valve is closed, whereby the full pressure of the water in the supply acts on the valve to hold it closed, and means for preventing the water pressure from being applied to the seating surface of the main valve before it rests on its seat, and for permitting leakage from the supply to the valve seat in all positions of the valve.

972,532.—Hose-Clamp. Milton P. McLaughlin, Wakefield, Mass., assignor of forty-five one-hundredths to H. C. McCarty, Williamsport, Pa. A hose clamp comprising segments having a pivotal interlocked engagement at one end, one segment having an extension at its opposite end provided with depending protecting flanges and the opposite end of the other segment having a bifurcated extension adapted to lie between said flanges and be spread into engagement therewith.

972,820.—Buffer Attachment for Closet-Seats. John Charles Cleis, South Bend, Ind. The combination with a closet bowl and seat, of plates secured to the under side of the seat and disposed radially with respect to the opening therein, each plate having a marginal inwardly directed flange, elongated buffers provided with enlarged heads engaged by the flanges, the outer faces of the buffers being transversely concaved to engage the bowl for centering the seat upon the latter.

GOVERNMENT CONTRACTS TO BE AWARDED.

Supervising Architect James Knox Taylor, Treasury Department, Washington, D. C., will receive sealed proposals as follows:

Until 3 p. m., Nov. 23, 1910, for the extension, etc., except elevator, including plumbing, gas-piping, heating apparatus, electric conduits and wiring system, of the U. S. postoffice at Rock Island, Ill.

Until 3 p. m., Dec. 1, 1910, for the heating and ventilating of the U. S. postoffice at New York City, N. Y.

Until 3 p. m., Dec. 5, 1910, for the construction, including plumbing, gas-piping, heating apparatus and electric conduits and wiring, of the U. S. postoffice at Santa Cruz, Cal.

Until 3 p. m., Dec. 8, 1910, for the construction, including plumbing, gas-piping, heating apparatus, electric conduits and wiring, of the U. S. postoffice at Carbondale, Pa.

All proposals should be in accord with drawings and specifications, copies of which can be obtained from the custodians of the above postoffices, or from the office of the Supervising Architect at Washington, D. C.

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He was very bashful and she tried to make it easy for him. They were driving along the seashore and she became silent for a time.

"What's the matter?" he asked.

"Oh, I feel blue," she replied. "Nobody loves me, and my hands are cold."

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will stand more grief and still look better than any other Tanks made, but if you pile a couple of threshing machines on top of one, it's bound to dent it some. We just mention this to let you know that they always start right, and if they don't reach you right, we'll make it right. Address, as usual,

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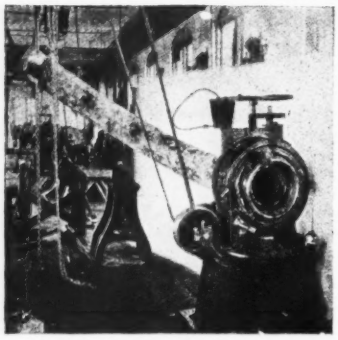
San Francisco, Calif.



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